MECO

THE NATION'S "STAR PERFORMER" on CURVES

MECO Lubricators are always "in there pitching" to help "strike out" high operating costs and curve rail hazards on a majority of North American Railroads. MECO actually doubles to quadruples curve rail and locomotive wheel flange life.

Other MECO Products: Velocity Power Rail Punch • Mack Reversible Switch Point Protectors (Prolong Switch Rail Life) • Meco Rail Layers (Lay Standard, Long, or Continuous Welded Rails) • Southworth Portable Brush Cutter (Does Work of 8 Men).

rail and flange lubricators for curve rail safety and economy.

★ Maintenance Equipment Company ★
Division of Poor and Company
RAILWAY EXCHANGE BUILDING · CHICAGO 4 · ILLINOIS

R-1394FC

The Kershaw CRIB-ADZE

...Another Example of KERSHAW Leadership!

DOUBLE YOUR ADZING PRODUCTION WITH THE KERSHAW CRIB-ADZE

NOW . . . the revolutionary Kershaw Crib-Adze works on either right hand or left hand rail. Operated by only one man, the Kershaw Crib-Adze cribs between the ties, adzes the ties and then creosotes all in one operation. It does the work formerly done by one Kribber, three adzing machines, one tie brush and one tie creosoter.

All ties are automatically adzed in the same plane, eliminating the necessity of spot surfacing behind the rail re-laying gang.

The Kershaw Crib-Adze can double the adzing production in your rail re-laying gang, and at a tremendous savings.

KERSHAW MANUFACTURING CO. INC

MONTGOMERY ALABAMA

Where track must be held in precise gage ... Bethlehem gage rods

On sharp curves, where outside joints have a tendency to "kick out," gage rods provide a reliable solution to the problem of gage maintenance. Placed on each side of the joint and at other appropriate points along the curve, they prevent spreading and hold the track in precise alignment and gage.

Bethlehem gage rods are forged steel rods 1¼ in. in diameter, with either a forged or a bent hook on one end, and a heavy adjustable clip with nut on the other end. Clips can be furnished either forged or malleable iron, insulated or non-insulated.

There are many points where the use of Bethlehem gage rods will prove advantageous: at heels of frogs and toes of switches; on bridge approaches and in tunnels; on roundhouse and turntable leads, and locomotive service tracks. In short, wherever operating conditions cause trouble in holding track to gage, you can benefit from Bethlehem gage rods.

A Bethlehem engineer will be glad to discuss gage rods in detail with you. A phone call or letter to our nearest office will bring prompt action.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

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CATERPILLAR ANNOUNCES

NEW DW15 (SERIES E) AND NEW No. 428 LOWBOWL SCRAPER

The No. 428 LOWBOWL Scraper

The DW15 (Series E) Tractor

Here's a new Cat team loaded with features that add up to one thing—A HIGHER PRODUCTION RETURN ON YOUR INVESTMENT. See your Caterpillar Dealer for details on this great team's performance.

GET THE STORY IN BRIEF ON THE OPPOSITE PAGE

A GREAT TEAM: The performance of the DW15 (Series E) Tractor and No. 428 Scraper can be summed up simply: bigger loads—faster.

FACTS ABOUT THE DW15 (SERIES E) TRACTOR

Around the world, the DW15 has proved that it can move material faster and more profitably than competitive machines in its class. Now there's a new DW15 (Series E) to give you even higher production. This is the story:

ENGINE: A new Caterpillar D326 Engine, designed especially for the DW15 (Series E), develops 200 HP (maximum output capacity).

And Caterpillar research has produced a 23% torque rise in this new engine! This means that high tractor rimpull is maintained through a wide range of travel speeds in each gear, and the need for gear changing is decreased. In fourth gear, for example, over 3,000 pounds of rimpull are delivered at travel speeds from 9 MPH all the way to 18 MPH. A new engine, yes—but with these traditional Caterpillar advantages: uses inexpensive No. 2 furnace oil without fouling; needs no fuel system adjustments; requires no cleaning of fuel injection valves.

TRAVEL SPEED: The DW15 (Series E) offers ten speed selections, from 2.7 to 37.2 MPH. But, more important, it provides four-wheeled sure-footedness—*the ability to use the speed on the job.* Operators ride with more comfort, feel greater stability. They travel faster, and in safety.

MANEUVERABILITY: Four-wheeled stability means faster cycle time because the DW15 (Series E) can make short radius turns at higher speeds. It can turn without stopping inside a 35-foot diameter and in a smaller area through use of a turn-back-turn maneuver.

VERSATILITY: The DW15 (Series E) provides versatility that far surpasses similar sized two-wheeled machines. It can be unhitched from its scraper and used as an independent unit to tow compactors, water wagons or other units, and it can be teamed with the Athey PR15 Wagon for rock hauling work.

FACTS ABOUT THE No. 428 LOWBOWL SCRAPER

CAPACITY: Struck—13 cu. yd.; heaped—18 cu. yd.

ADVANCED DESIGN: There is more to Caterpillar's exclusive LOWBOWL design than a low bowl profile. Width and length proportions are designed to give maximum loading efficiency. And every component—particularly the apron, ejector, cutting edge—is likewise designed to do its part in achieving capacity loads.

LOADABILITY: The final result of this careful engineering is this: bigger loads—faster. LOWBOWL design gives the new Caterpillar No. 428 Scraper a faster loading rate because incoming material meets less material resistance and less friction from the load already in the bowl. While other scrapers are still in the cut struggling for the last few yards of their load, the new Cat units are on their way to the fill—with big pay loads!

NEW FEATURES: Outstanding new features of the No. 428 include: increased ground clearance—for high-speed travel in rough going; increased apron lift—for faster ejection of any material; large area pushblock—for better pusher contact.

NEW TIRES FOR THE DW15-No. 428

Both the CAT* DW15 (Series E) Tractor and No. 428 Scraper feature 26.5-25 wide-section tubeless tires—the product of extensive co-operative research by Caterpillar Tractor Co. and leading tire manufacturers. Tubeless tires offer load-carrying capacity comparable to conventional tires at a *reduced inflation pressure.* This gives better flotation and traction while decreasing rolling resistance. The wider tire treads take a "grouser like" bite, making more efficient use of engine horsepower. And tubeless tires eliminate 80% of the down time caused by tire failure.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

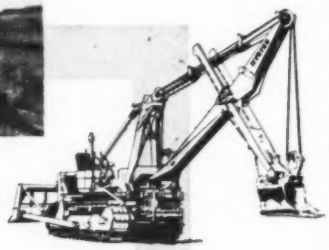
CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

HYSTAWAY® EXCAVATOR-CRANE

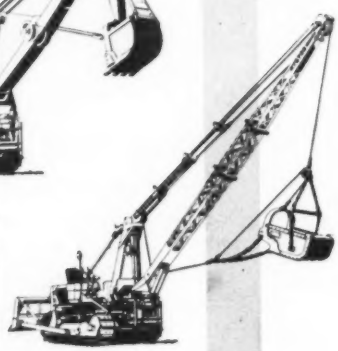
TODAY'S MOST *Versatile* RAILWAY MAINTENANCE MACHINE



SHOVEL

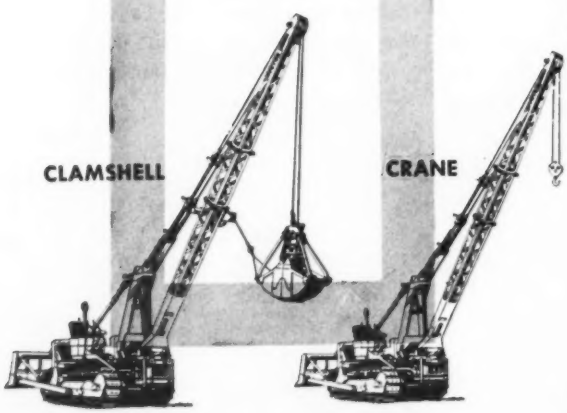
BACKHOE

DRAGLINE

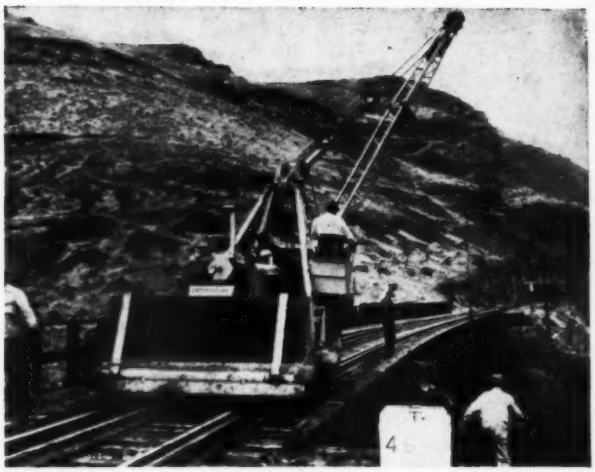


CLAMSHELL

CRANE



Hystaway is a registered trademark of Hyster® Company
Caterpillar is a registered trademark of Caterpillar Tractor Co.



HYSTAWAY, mounted on Caterpillar D8, D7 or D6 tractor, provides an all-purpose machine that can handle all these maintenance and construction jobs:

Loading and Unloading Rail
Laying Rail
Handling Construction Materials
Handling Ballast
Lifting Equipment Off Track

or as a bulldozer—
Ditching and Filling
Grading, Clearing
These are only a few of the jobs that make Hystaway the ideal Right-of-way maintenance machine.

Exclusive **HYSTAWAY** *advantages:*

Complete Track-Type Tractor Mobility
Moves on or off track quickly; travels equally well on the track, or over rough ground.

No Tail Swing
Can work from inside gondola car in confined areas anywhere. 240° boom swing provides a wide working range.

Powered by Tractor Diesel Engine means faster, more efficient performance.

Conventional Lever-Bank Controls
Easy to operate from convenient adjustable operator's seat.

Converts Fast, for Other Types of Service
Optional Front End Equipment
Gives you full-production—Shovel, Backhoe, Dragline, Clamshell or Crane.

Bulldozer
Ready at all times for light dozing. With the boom removed, it's ready for high production and heavy dozing jobs.

Ask your Caterpillar-Hyster Dealer for further details.

HYSTER COMPANY

HYSTAWAY FOR RAILROAD CONSTRUCTION AND MAINTENANCE

HYSTER

2902-56 N. E. CLACKAMAS STREET.....PORTLAND 8, OREGON
1802-56 N. ADAMS STREET..... PEORIA 1, ILLINOIS
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FACTORIES: Portland, Ore.; Danville, Ill.; Peoria, Ill.; Nijmegen, The Netherlands.

AJAX CUPS CAN HELP REDUCE ACCIDENT COSTS . . .

. . . CUT DOWN ABSENTEEISM . . . KEEP WORK ON SCHEDULE . . .

This drinking water service offers
3 BIG ADVANTAGES FOR TRACK MAINTENANCE GANGS

1 Whether to comply with the law – which in some states requires it – or simply to promote good employee relationships, many roads now supply clean fresh drinking water to maintenance gangs, by using AJAX Cups and equipment.

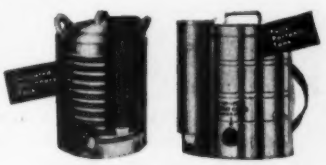
2 Crisp, clean AJAX Cups reduce the hazard of transmitted infections, thus reduce absenteeism, help keep important maintenance work on schedule.

3 Safety-imprinted AJAX Cups aid your accident-prevention program by putting safety messages right in your workers' hands several times daily . . . and safety messages *that get read* do help prevent accidents.

Developed out of long experience with railroad work, AJAX Complete Drinking Water Service is ideally suited to the needs of track maintenance gangs . . . actually works three ways to cut your operating costs.

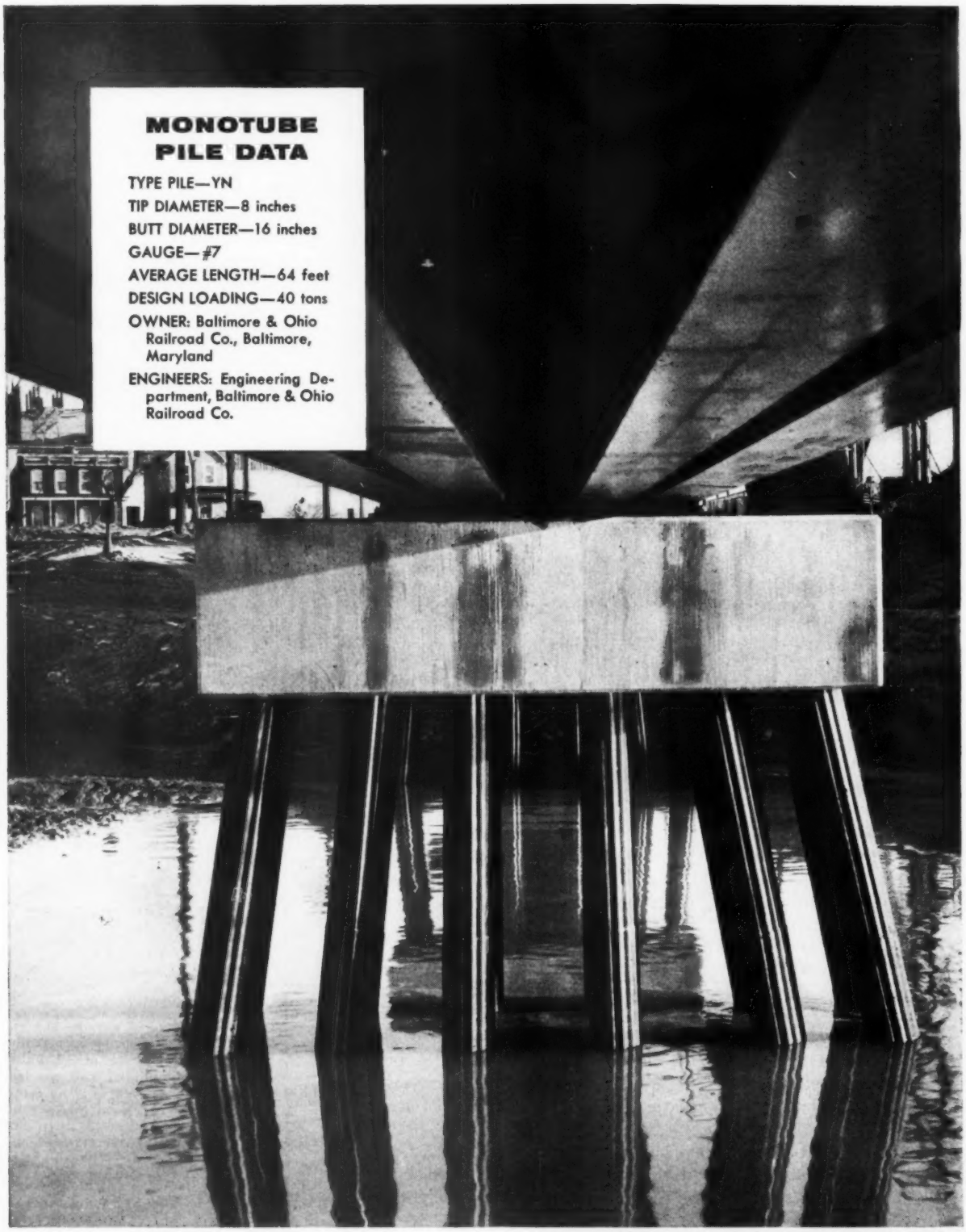
Write today **for samples of imprinted Ajax Cups and new folder giving complete details on complete drinking water service.**

AJAX® CUPS – wedge-shaped, easy to hold – dispense open, ready to drink from; come in 4, 6 and 7 oz. sizes, imprinted with assorted stock safety messages at no extra cost – or your own message to order.



United States Envelope Company

General Offices: **Springfield 2, Massachusetts** *15 Divisions from Coast to Coast*



DESIGN ECONOMY plus CONFIDENCE with Monotube piles . . . a sizable saving over conventional pier design, yet complete conformity with railroad specifications. That's the record of these Monotube piles used by the Baltimore & Ohio Railroad at Westport, Maryland.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL

Monotube Foundation Piles

PLASSER
High Capacity HYDRAULIC TAMPER

"One man tamps 1100 ft. an hour"

says Canadian M/W Engineer

". . . the total time to tamp 11 rails with 24 ties to panel was 22 minutes for one insertion . . . It would appear that the machine was capable of tamping 1100 feet of track (per hour) if given complete freedom to work. To date the track has stood up well."

The PLASSER VKR-01 HIGH CAPACITY HYDRAULIC TAMPER is the latest development in track maintenance, incorporating hydraulic drive and control. It assures highest performance, accuracy and simple handling, resulting in absolutely uniform compacting of ballast.

Tamping units consist of 16 units made of tough, wear-resistant steel which, through vibration and compression, work the ballast under the ties. It is especially effective in loosening fouled or cemented ballast beds. It works with minimum interruptions; a compressed-air elevating device moves it off-track in two minutes. Exceptionally quiet in operation.

8 ADVANTAGES

1. **Entire weight of machine rests on already-tamped track.**
2. **Each tool packs to full pre-set pressure independently of other tool pairs; results in uniform ballasting.**
3. **Automatically increases tamping pressure at joints and high rails at curves.**
4. **Adjustment for deep or ordinary tamping may be made while running.**
5. **Good "trackability"; rubber-cushioned axles damped vibration.**
6. **Easy, simplified push-button operation helps personnel efficiency.**
7. **Diesel-powered compressor; quiet operation.**
8. **One-man operation; exceptionally high performance.**

ERWIN W. KLOSE

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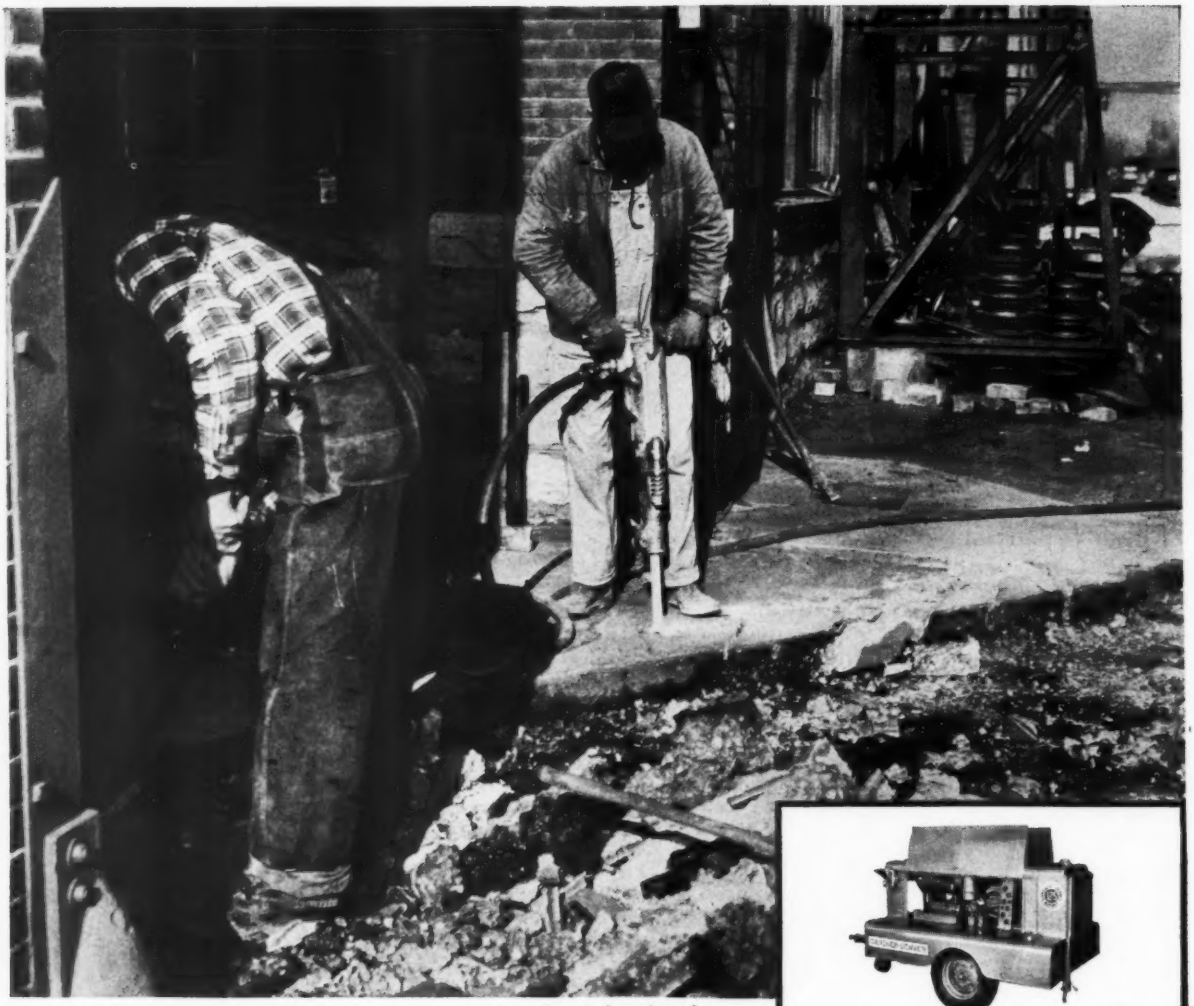
PLASSER RAILWAY MACHINERY



Terminal repair work.

Rotary portable compressors, gas or diesel.

Rock and utility drills.

Backfill tampers.

Trouble-free sump pumps.

So many wayside jobs this team does faster!

Hook up a dependable Gardner-Denver Portable Compressor and sturdy Gardner-Denver Air Tools for faster, lower cost maintenance and demolition work!

Concrete busting, backfill tamping, rock drilling, ditch draining—these are just a few jobs a Gardner-Denver combination gets done, fast, without down time for equipment repair. We'll gladly send literature at your request.

ENGINEERING FORESIGHT PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

For day-in day-out hard labor

this fast-stepping tractor gives you double-duty service

...or speedy emergency service

Tournatractor is so fast and mobile, it can often get to an emergency work area . . . do its job . . . and be on its way back . . . before a work-crew and gang train could be organized.

You save money when you buy maintenance equipment that can do more than one job . . . and do them with a minimum of personnel. Most maintenance-of-way machines are strictly one-purpose, of course. But when you're choosing *tractors*, you have basically different types from which to select. Your careful decision here can save your railroad a lot of money.

Compare Tournatractor®, for instance, with any other tractor. This 210 hp LeTourneau-Westinghouse unit has all the muscle needed for heavy dozing assignments or big push-and-pull jobs. It offers excellent traction — on wide, low-pressure tires — and *more* engine horsepower than the best-known crawler-tractors in its price class. At working speeds over 2 mph, Tournatractor matches or betters drawbar pull of any comparative crawler.

Goes anywhere . . . on or off tracks

Assets that make Tournatractor a *better* buy are its *speed* and *mobility*. Unlike crawlers, this machine *goes anywhere*, under its own power . . . *on* or *off* rail right-of-way. And it travels *fast*, at speeds to 17.2 mph — 2 to 3 times the top speed of most crawlers.

What this means to you is this: When you choose Tournatractor, you get not only a do-it-all tractor for regular field work, but you add a top-flight emergency tool to your fleet *at no extra cost*. No matter *where* this unit may be working, a phone call or radio message will send it speeding to a washout, mountain slide, or other emergency area anywhere along your trackage.

On its way immediately . . .

Tournatractor gets rolling in a hurry. You need no trailer or flatcar, no loading crew, no special planking. The operator just hops on, and goes . . . via the *shortest* route. Tournatractor's big tires straddle rails, rolling along tie-ends. It crosses trestles . . . goes through tunnels, along highways, or cross country.

Tournatractor doesn't need wide berms or set offs to get out of the way of revenue traffic. It gets on or off tracks easily, doesn't trip or damage block switches, or chamfer ties.

Works hard . . . works fast

On routine jobs, like cleaning yards or stockpiling coal . . . or on emergency assignments, like clearing rockslides . . . Tournatractor works quickly. Boosting its work capacity are 4-wheel drive . . . instant gear-shift with constant-mesh transmission . . . torque converter . . . 4-wheel disc-type brakes . . . fingertip electric controls.

Let us show you — with RR owner reports and detailed specifications — how 1-man Tournatractor can do *many* jobs efficiently and economically in *your* equipment fleet.

Another valuable service Tournatractor offers is car spotting — with optional regulation RR coupler. Spare time switching often "saves the day" in spotting suddenly-needed cars, or pulling cars out of danger areas.

CT-1469-RR-1

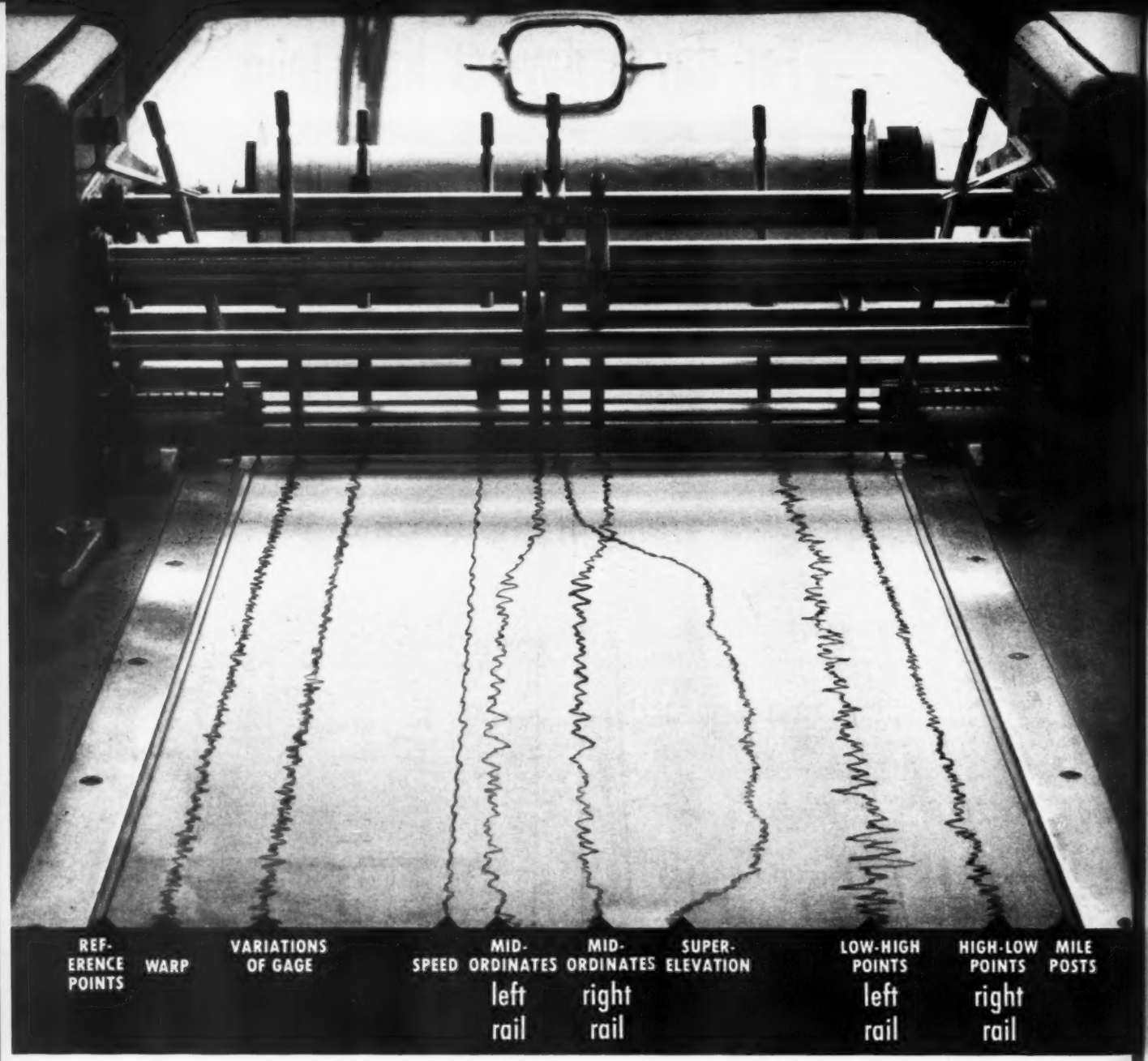
LeTourneau-WESTINGHOUSE Company

RAILROAD SALES DIVISION, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

GEARED TO PROGRESS
RI MEMBER



C HART a TRUE COURSE for your TRACK MAINTENANCE forces with a MATISA "TRACK-FAX"® Recording Car

- Ask how to get a FREE TRACK-FAX® chart . . . write to:

Matisa EQUIPMENT CORPORATION

1020 Washington Avenue • Chicago Heights • Illinois

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RAILWAY
TRACK and STRUCTURES

News notes...

. . . a rèsumè of current events throughout the railroad world

New construction by U.S. railroads in April was $2 million above April last year and March this year—$37 million, as compared to $35 million. The total for the first four months of 1957 was estimated to be $135 million, as compared with $127 million in the first four months of '56—an increase of 6 per cent.

●

Eastern railroads have requested the ICC to grant an immediate interim increase of 25 per cent in the rates paid them for transporting the mails, retroactive to July 3, 1956. The Commission is already considering their petition for an over-all increase of approximately 64 per cent—expected to yield the eastern carriers an additional $76 million a year and provide a 6 per cent return on their investment in mail-carrying and handling facilities.

●

The Great Northern has contracted with Pipe Line Technologists, Inc., of Texas, for a preliminary engineering appraisal of the feasibility of constructing a pipeline between the Williston Basin oilfield and the St. Paul-Minneapolis and Duluth-Superior regions.

●

The Northern Pacific and the Shell Oil Company plan immediate joint exploration and development of a new area of more than 15,000 acres in the Williston basin.

●

Only automation, "or some solution lying in that general direction," can save the railroads from the "squeeze between mounting costs and vigorous competition," said J. P. Kiley, president of the Milwaukee, speaking before the Railroad Division of the American Society of Mechanical Engineers recently.

●

The railroads are clamoring for—and getting—increased commuter fares. The Pennsylvania has won permission to hike its commuter fares 15 per cent on certain lines in New York state, and the Burlington has been authorized to increase its fares in the Chicago area 17½ per cent. Both the PRR and the Reading have asked for increases on lines serving points in Pennsylvania, and the Pittsburgh & Lake Erie wants to raise its fares in the Pittsburgh and Youngstown (Ohio) areas.

●

Two large railroads acquired new presidents during the last month or so. Ernest S. Marsh, financial vice-president of the Santa Fe, was made president to succeed Fred G. Gurley who became chairman and chief executive officer. On the Missouri Pacific Russell L. Dearmont, vice-president and general counsel, was named president in place of Paul J. Neff who was elected to the new post of chairman of the board.

●

Between 1947 and 1954, Class I railroads lost more than one-fifth of their "potential" tonnage, according to a study made by the ICC's Bureau of Transport Economics and Statistics. Potential tonnage in 1954 was put at 1,548,745,000 tons. Railroad traffic in that year was 1,250,124,000 tons. The "loss" was 308,621,000 tons, or 20.2 per cent of the potential.

Finished view of rebuilt structure across Sugar Creek. Collars of Armco Corrugated Metal Pipe extending above water level provide protection against floating debris.

Unique Construction Method Used To Rebuild Bridge with Armco Piles

When originally constructed, the Pennsylvania Railroad Bridge over Sugar Creek in southern Indiana consisted of five steel spans supported on wood pile bents with wood caps and blocking.

Several years ago it was evident that the blocking and piles had to be replaced. New bents were designed using Armco Steel Pipe Piles. Here's how the job was done.

First, a temporary tower bent was driven in the center of each existing span; then a turntable was mounted on top of the bent. Each span could be opened to permit driving the Armco Piles under the original structure and also quickly closed for railroad traffic.

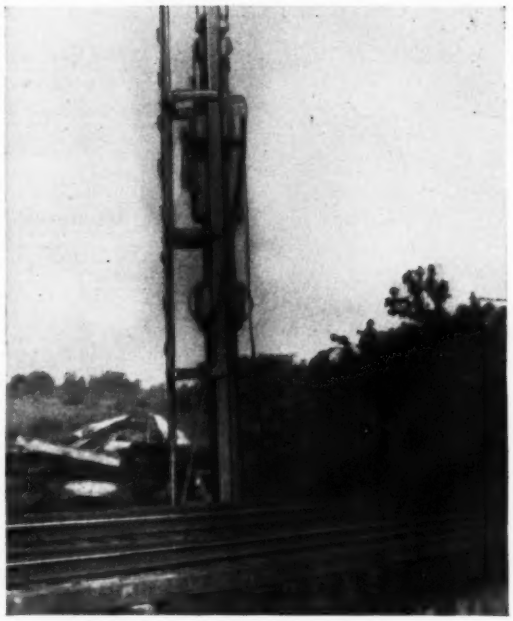
After the Armco Piles were driven, filled with concrete and topped with a concrete cap, the existing superstructure was shifted onto the new supports and the old piles removed.

* * *

Write us for complete data about Armco Steel Pipe Piling. Armco Drainage & Metal Products, Inc., 4937 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

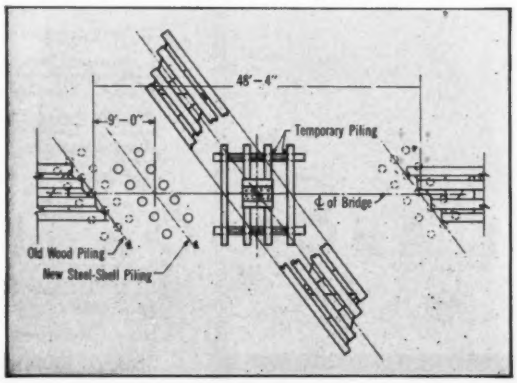
ARMCO®

ARMCO STEEL PIPE PILING



With the span swung out of the way on a special turntable, it was easy to drive the Armco Pipe Piles on correct line.

The contractor devised this turntable arrangement to permit driving without disturbing the existing substructure.



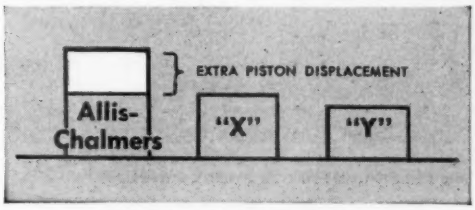
ALLIS-CHALMERS DIESELS OFFER

more USABLE power for your equipment

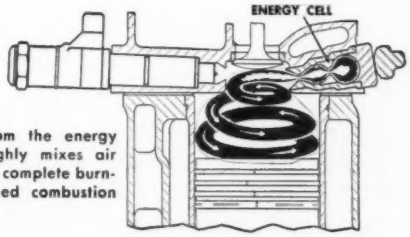
more PROFIT for you

Bucyrus-Erie 54-B, powered by an Allis-Chalmers 250 hp. diesel engine, driving piling on construction of a railroad spur line in Arizona.

You have a new kind of engine performance with Allis-Chalmers diesels. Their big piston displacement gives you greater reserve power, higher usable torque in the normal operating range. Their unique "follow-through" combustion results in highly efficient burning — builds up compression pressure slowly, sustains it over a longer period. Result: more *usable* power.



Allis-Chalmers' big piston displacement gives you extra usable power.



A blast from the energy cell thoroughly mixes air and fuel for complete burning, sustained combustion pressures.

Equipment must be *working* to be *earning* — Allis-Chalmers engines earn more because they are on the job working more. Rugged, simple construction, with fewer parts, means a minimum of maintenance. Get the complete story of why Allis-Chalmers engines give you more usable power, more profit. See your Allis-Chalmers engine dealer.

TRANSPORTATION DEPT., TRACTOR GROUP, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

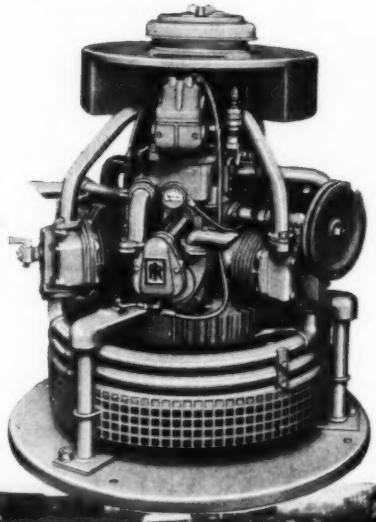
BE-9B

Ingersoll-Rand
SPOT-AIR
36 cfm

This compact, versatile compressor
MULTIPLIES MANPOWER
all along the line!

USE IT TO OPERATE

Tie Tampers
Rail Grinders
Impact Wrenches
Spike Drivers
Nail Drivers
Diggers
Paving Breakers
Concrete Vibrators
Riveters
Electric Generators
and other tools



I-R Spot-Air compressor operating an I-R rail grinder. Note special "roll-along" railbarrow mounting with track-spaced rollers.

I-R Spot Air compressor driving an I-R impact wrench for tightening rail joints. Railbarrow mounting (with built-in air receiver) can easily be moved off the track in a hurry.

With the Ingersoll-Rand gasoline engine driven Spot-Air compressor, you can replace muscle power with low-cost *air power* on hundreds of railway maintenance and construction jobs.

The Spot-Air is so small, so light, so easy to move, that you can take it anywhere. Weighing only 265 pounds, it delivers full 36 cfm at 80 psi. That's ample power to operate four tie tampers—or to drive any of the other cost-saving air tools noted above. Yet one or two men can move it with ease—and it takes up only 4 square feet of floor space in a section car or truck.

Completely air cooled, this ruggedly constructed, self-contained unit will operate in any kind of weather without danger of freezing or overheating. For the complete Spot-Air story, send today for your copy of Bulletin 2264-B.

Ingersoll-Rand
2-307 · 11 Broadway, New York 4, N. Y.

AIR POWER AND AIR TOOLS FOR LOW COST MAINTENANCE OF WAY

The linking of these two famous symbols . . .

means *Better Service*

for users of treated wood!

TIES
BRIDGE TIES
POLES
CROSS ARMS
PILES
TIMBER

The American Creosoting Corporation, a pioneer in the development of the wood preserving industry has joined forces with Union Bag-Camp Paper Corporation—one of the nation's most progressive manufacturers of products from wood.

As a result, AMCRECO'S technical skill and experience, developed through half a century of serving the largest users of treated wood, is now reinforced by Union-Camp's resources.

Convenient plant locations, extensive resources and experienced personnel have been teamed to provide you with a new standard of service and dependability. This will be reflected in modernized facilities, improved deliveries (from stock in many cases) and careful attention to your specifie requirements.

Let us show you how this new organization can be of help to you.

Time is Our Best Testimonial

571

AMERICAN CREOSOTING CORPORATION
Louisville 2, Kentucky
18 Strategically Located Treating Plants to Serve You
Subsidiary of
UNION BAG-CAMP PAPER CORPORATION

It Gets Around

You see it everywhere . . . in spots where other pumps couldn't reach or work. One man simply picks up and carries a Homelite Gasoline-Engine-Driven Pump. He sets it up where he wants it and starts it. That's all. Fast self-priming. 28 foot suction lift. Pumps anything from seepage to 15,000 gals. per hour . . . and non-clogging. No wonder you see more Homelite Pumps on more construction jobs than any other pump. A Homelite really gets around. Ask for a demonstration on your job.

HOMELITE
A DIVISION OF TEXTRON INC.
206 RIVERDALE AVE., PORT CHESTER, NEW YORK
MANUFACTURERS OF CARRYABLE PUMPS
GENERATORS · BLOWERS · CHAIN SAWS

Right-of-way maintenance --simple with an Adams

Why not let one self-propelled machine, with a one-man crew, handle most of your right-of-way maintenance? It's not only possible — it's happening every day on those lines which use a modern Adams motor grader to keep right-of-way in first-class shape.

The Adams is a versatile off-track tool. It goes by most direct route to the next job. Machine crosses tracks, ties, switches, without damage — follows right-of-way embankment, or rides highways to make maximum use of speed. Grader has 8 forward speeds to 25 mph (11 with 3 optional "creeper" gears). It has 4 in reverse — to 13 mph — for fast backup in shuttle grading.

Attachments extend work range

All 6 models in the Adams line are rugged, heavy-duty rigs — with plenty of weight to hold big blade steady — extra horsepower to handle hard-to-work materials. Optional equipment extends grader's range of usefulness. *Scarifier* rips out old asphalt, hard-packed dirt, roots, and stones. *Snow plow* and *wing* keep travel routes clear in winter months. *Dozer blade* pushes debris off right-of-way, backfills around culverts, cleans up spillage in yards.

Handles maintenance on regular schedule

With an Adams, you can plan on a big lift in your year-round right-of-way maintenance from only one man and this one machine. You'll find it's easy to operate on a fixed schedule — detect and fix small troubles before they become major problems. One man, on one grader, handles dozens of RR jobs ... with no extra worry on your part about shovels, draglines, flatcars, gang cars, big work crews.

Use this modern grader to cut and clean ditches, slope banks, widen shoulders, spread ballast, level fills, grade access roads, build grade for sidings, remove brush and weed growth. In your yards, the Adams can clean up around water towers, coal docks, shops, all types of stockpiles.

Ask us to show you a modern, cost-savings Adams grader at work.

Wide 12-ft. blade (on most sizes of Adams grader) holds any cut accurately — because of grader's balanced-weight design and extra horsepower. Wide range of speeds in heavy-duty Adams line (8 forward — 11 with optional "creepers" — 4 in reverse) means power-speed ratio can always be accurately matched to the job. Fine-finishing in tough materials is no problem with an Adams.

A size ADAMS for every need

New POWER-*Flow* 660 —
190 hp with torque converter . . 30,200 lbs.

Model 660* — 150 hp diesel . . 30,050 lbs.

Model 550* — 123 hp diesel . . 26,370 lbs.

Model 440* — 104 hp diesel . . 24,080 lbs.

Model 330* — 80 hp diesel . . 23,020 lbs.

Model 220 — 60 hp G.M. diesel 15,500 lbs.

*Choice of Cummins or General Motors engines.
(Weights shown are usual working weights)

TraveLoader — high-speed, heavy-duty, self-propelled, belt-type loader for picking up and loading loose materials into trucks from windrows or stockpiles. 55 hp gasoline, 60 hp G.M. diesel optional 17,500 lbs.

POWER-*Flow*, Adams—Trademark AG-1340-RR-b

LeTourneau-WESTINGHOUSE Company

RAILROAD SALES DIVISION, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

GEARED TO PROGRESS
RI MEMBER

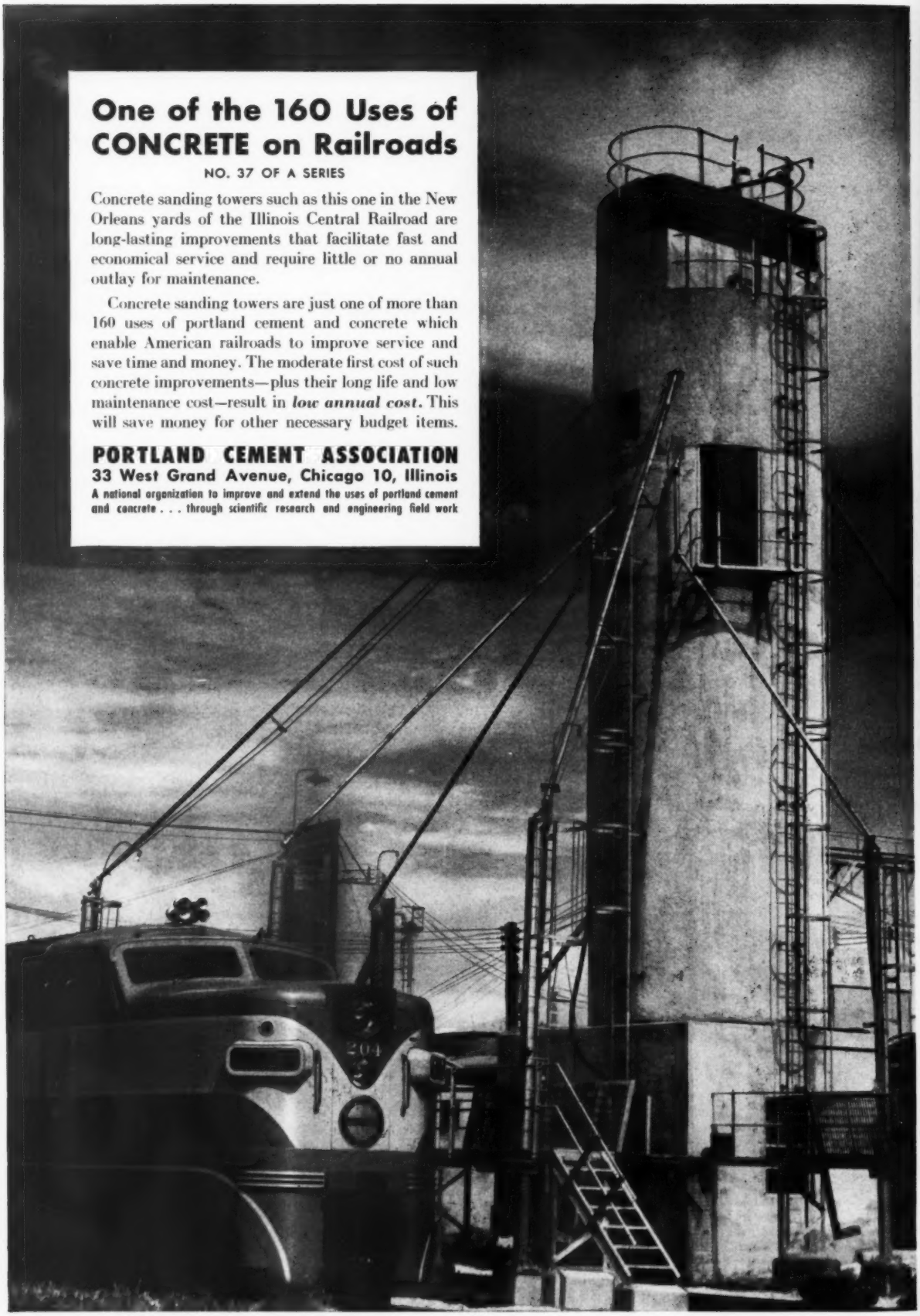
One of the 160 Uses of CONCRETE on Railroads

NO. 37 OF A SERIES

Concrete sanding towers such as this one in the New Orleans yards of the Illinois Central Railroad are long-lasting improvements that facilitate fast and economical service and require little or no annual outlay for maintenance.

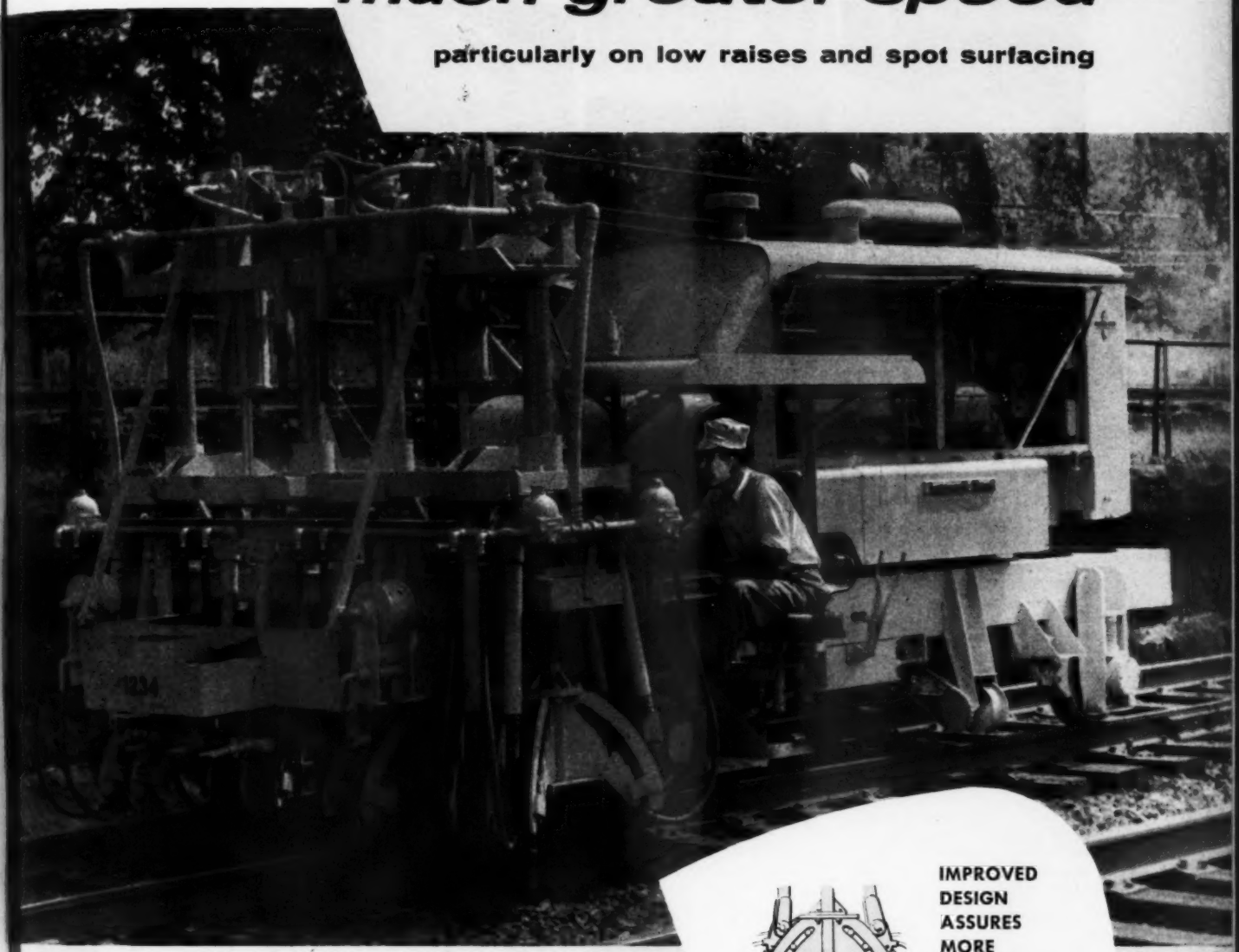
Concrete sanding towers are just one of more than 160 uses of portland cement and concrete which enable American railroads to improve service and save time and money. The moderate first cost of such concrete improvements—plus their long life and low maintenance cost—result in ***low annual cost.*** This will save money for other necessary budget items.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work



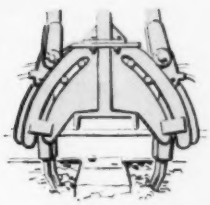
now *much greater speed...*

particularly on low raises and spot surfacing

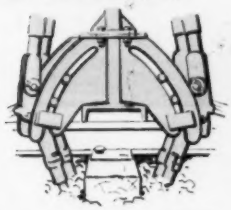


Improved cam plate design—plus a special gun with a greater foot-pound blow—result in substantially increased tamping speed. In some cases, double the former footage has been attained in spotting and with solidified ballast conditions. A new style retainer allows fast changing of tamping tools to fit any ballast condition. *Write for Bulletin AT-56.*

IMPROVED DESIGN ASSURES MORE EFFECTIVE TAMPING



New cam plate permits guns to penetrate solidified or high ballast conditions rapidly.



Angle of cam directs maximum tamping under the rail bearing area of the tie.

McWILLIAMS
TIE TAMPER

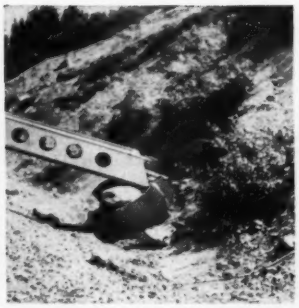
GEARED TO PROGRESS
RI
MEMBER

Railway Maintenance Corporation
PITTSBURGH 30, PA.

McWilliams Mole, Super Mole . . . McWilliams Tie Tamper, Crib Cleaner, Ballast Distributor . . . TieMaster . . . LineMaster . . . SpikeMaster . . . Tie Unloader . . . BoltMaster . . . GaugeMaster

1 Early morning start. Railroad Gradall, with oversize track-climbing tires, easily climbs rails to move up the line to first job site.

2 First job—cleaning drainage ditches, working right from roadbed. Gradall's accurate, fast digging action slashes costs on this type of work.



3 Complete control of Gradall's telescoping, arm-action boom and the wrist-like action of the bucket enables operator to grasp and remove even large boulders.

4 No traffic interruptions with a Gradall! When the way must be cleared, the Gradall simply straddles or moves off track while train passes.

Let's spend

A DAY WITH A RAILROAD GRADALL®

These photos were taken on an actual full-day Gradall demonstration for officials of a leading railroad. They show a few of the many maintenance and construction jobs on which Gradalls have proved real cost cutters for railroads.

5 Quickly back on the job! Gradall cleans culvert openings, working in close around culverts, without damaging pipe, maintaining proper grade.

6 Gradall shows its power. Should a Gradall encounter soft spots, pushing with its powerful telescoping boom will raise carrier wheels to free machine.

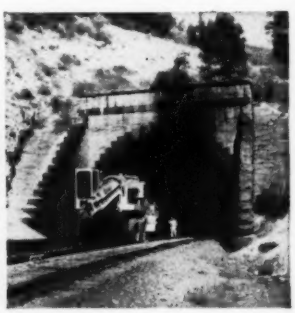
7 Off to the next job—right down the roadbed, with ample clearance for passing trains. Where tracks are closer together, Gradall can straddle track.

8 Gradall makes fast work of clearing a rock slide. A special rock bucket, attached in less than 5 minutes, easily handles large rocks.

9 Clearing the slide, the Gradall swings around a full 180°, and "reaches out" across roadbed, to dump rock and build up shoulder on far side.

10 Aligning track on curve, Gradall exerts its powerful hydraulic pressure—pushing or pulling—properly positioning track without moving ballast

11 Laying rails, Gradall is used as a crane to quickly and accurately position rails. This is just another of the many "bonus" railroad jobs handled by Gradalls.



12 A full day's work done, Gradall heads for home. Less than 12' clearance permits a Gradall to easily drive through or even work inside tunnels.

For a Gradall field demonstration on your work, write:
GRADALL DIVISION, WARNER & SWASEY CO., CLEVELAND 3, OHIO

Gradall®
DIVISION OF WARNER & SWASEY Cleveland
PRECISION MACHINERY SINCE 1880
® Reg. U. S. Pat. Off.

Complete maintenance-of-way with one machine...a GRADALL

WORLD'S SAFEST POWER SAW

NO DANGEROUS CHAIN

•hand saw safety
•power saw speed

Photo Courtesy of C. B. & Q. Railroad

GAS all-new

WRIGHT® REBEL

20" RECIPROCATING BLADE

Saves time, money on 1001 jobs: Cuts sheathing, piling, concrete forms, ties; does *precision* mill-edge cutting; clears land; ideal for bridge-work and wrecking.

- Cuts in all positions.
- Sharpen blades in 5 min.—right on the job!
- Minimum maintenance, lowest upkeep.
- Operator needs no special training
- Less than 25 lbs. complete.

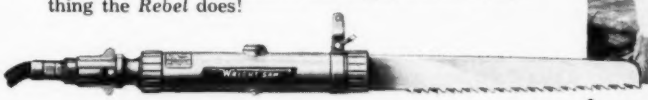
ONLY $189.50*

pneumatic AIR

WRIGHT® CYCLONE

21" RECIPROCATING DOUBLE BLADE

Exceptionally lightweight—big capacity. No fumes... no spark hazard. Actually cuts under water! Connect to any 60 cu. ft. compressed air supply...does everything the *Rebel* does!



- Slices 12 x 12's in less than a minute.
- Unbreakable blades.
- Only 14½ lbs. total!
- Precision cuts—even in 12" radius!

ONLY $295.00*

*Prices include blades. F.O.B. Factory, Sheboygan. Prices apply in U.S. only.

WRIGHT AIR LINE OILER

Gives trouble-free lubrication to Wright Air Saw or other pneumatic tools. Meters oil into air supply. Light weight 1¾ lbs. ½ pint capacity. Non-clogging, works in any position. ONLY $19.95

DEALERSHIPS AVAILABLE

FREE FOLDERS TELL HOW TO STREAMLINE YOUR CUTTING JOBS!

WRIGHT POWER SAW AND TOOL CORP.

Subsidiary of THOMAS INDUSTRIES INC.

Executive Offices: 410 S. Third Street, Louisville 2, Ky. Dept. 45-F

Factories at Sheboygan and Ft. Atkinson, Wis.; Hopkinsville and Princeton, Ky.; Los Angeles 22, Cal.; Ft. Smith, Ark.

☐ Send me the facts on the new Wright Rebel (gasoline)
☐ Send me your folders on the Wright Cyclone (pneumatic) and oiler
☐ I am interested in becoming a dealer.

NAME_____

COMPANY (if any)_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

News about people

RAILROAD

BALTIMORE & OHIO—Henry Seitz, designing engineer of bridges and buildings, has been named structural engineer at Baltimore, Md. **R. G. Rayburn,** division engineer at Baltimore, has been transferred to Wheeling, W.Va., succeeding **S. L. Thompson. H. S. Ross,** Division engineer at East Salamanca, N. Y., has been transferred to Washington, Ind., succeeding **T. W. Elmore,** deceased. **R. A. Downey,** assistant division engineer at Cumberland, Md., has been promoted to division engineer at East Salamanca, succeeding Mr. Ross. **Gurney H. Dayette, Sr.,** assistant to chief engineer at Baltimore, has retired.

BANGOR & AROOSTOOK—Vinel J. Welch, has been appointed assistant engineer at Bangor, Me., succeeding **J. W. Stannix,** resigned. Mr. Welch comes to the B&A with several years of experience in the engineering department of the Erie.

CHESAPEAKE & OHIO—H. T. Seal, assistant engineer of buildings, has been appointed engineer of buildings at Richmond, Va., succeeding **E. W. Niblet,** retired. **J. H. Adams** has been appointed assistant engineer of buildings, succeeding Mr. Seal.

ERIE—Loyal R. Henderson has been named assistant division engineer, Mahoning division, at Youngstown, Ohio, succeeding **Paul L. Crowe,** retired.

GRAND TRUNK WESTERN—C. J. Morris, assistant chief engineer, Central region, Canadian National at Toronto, Ont., has been appointed chief engineer at Detroit Mich., succeeding **A. N. Laird,** retired.

JACKSONVILLE TERMINAL — J. F. Warrenfells, Jr., has been appointed chief engineer, succeeding **E. B. Harris.**

LEHIGH & NEW ENGLAND — H. C. Tunison, general manager and chief engineer, has been appointed vice-president and general manager at Bethlehem, Pa. The office of chief engineer has been abolished.

NEW YORK CENTRAL — W. J. Kernan has been appointed district engineer with headquarters at Syracuse, N. Y.

NICKEL PLATE — Fred M. Whitmore has been named assistant division engineer at Ft. Wayne, Ind.

PENNSYLVANIA — S. G. Wintoniak has been appointed engineer structures, Northwestern region, at Chicago.

SANTA FE — John G. Fry, assistant chief engineer on the Coast Lines, has been promoted to chief engineer of the same lines with headquarters as before at Los Angeles, succeeding **L. H. Powell,** retired. **R. G. Garland,** assistant engineer at Chicago, has been named acting roadmaster at Oceanside, Calif.

SEABOARD AIR LINE — J. N. Gatch, assistant roadmaster at Richmond, Va., has been promoted to roadmaster succeeding **L. F. Barrs,** retired. **W. A. Thompson, Jr.,** assistant to the division engineer at Savannah, Ga., has been named assistant division engineer at that location, succeeding **W. G. Merritt,** promoted to principal assistant division engineer at Raleigh, N. C. **G. W. Martin,** assistant roadmaster at Hamlet, N. C., has been promoted to roadmaster at that location succeeding **R. L. Scott,** on leave of absence.

OBITUARY

Charles E. Cassagne, Jr., 74 chief engineer for the Mississippi River Bridge Authority and administrative engineer for the New Orleans Railroad Terminal Board, died recently.

John A. Lahmer, 84, retired senior assistant engineer of the Missouri Pacific, died recently at St. Louis.

Carlos S. Kirkpatrick, 76, retired chief engineer of the Gulf Coast Lines and the International Great Northern at Houston, Tex., died recently.

George E. Righter, retired division engineer of the Erie's Buffalo division, died recently.

Paul W. Elmore, 64, division engineer of the St. Louis division of the Baltimore & Ohio, died recently at Washington, Ind., after 43 years of service.

SUPPLIERS

ALLIS-CHALMERS MANUFACTURING CO. — V. M. Holloway, assistant sales manager of the Construction Machinery Division, has been promoted to head up a department which will devote its full time to growth development of dealers and their sales organizations. **J. M. Haile,** eastern territory manager of the division, has been promoted to assistant sales manager to take over the duties of Mr. Holloway. **K. A. New,** succeeds Mr. Haile as eastern territory manager. Mr. New was formerly construction machinery district manager in the Metropolitan New York area.

BUCYRUS-ERIE — Dean Calland, has been appointed sales representative with headquarters at Phoenix, Ariz., reporting to the firm's western district office at South San Francisco, Calif.

D. B. FRAMPTON & CO. — R. M. Hamilton, executive vice-president, has retired, but will continue to serve in an advisory and consulting capacity. Mr. Hamilton has been identified with the wood preservation field since early 1919, when he started as a yard foreman for the Central Creosoting Company at Finney, Ohio. Two years later he became associated with the T. J. Moss Tie Company, where he remained for 18 years. For the last 18 years he has been associated with the Frampton concern and its subsidiaries.

KERSHAW MANUFACTURING COMPANY, INC.—Jeff W. Davis has been promoted to executive vice-president and William A. McKay has been appointed vice-president of sales. Mr. Davis moves up from vice-president, a position he had held for seven years. Mr. McKay was formerly connected with the Kershaw Equipment Leasing Corporation, a wholly owned subsidiary of the Kershaw Manufacturing Company

At the same time, the company announced the appointment of **Harry Campbell** as sales coordinator. Announcement of the appointments was made by **Royce Kershaw,** president.

LE ROI DIVISION — Don S. Permar, field sales manager for this division of the Westinghouse Air Brake Company, has been named to the newly created position of assistant general sales manager with headquarters at Milwaukee, Wis.

MID-WEST FORGING & MANUFACTURING CO.—James R. Wilson, vice-president, has been elected president, succeeding **J. L. Hench,** who becomes chairman of the board of directors. Mr. Hench will continue as chief executive officer and treasurer. **Ray T. Johnson, Jr.,** secretary, has been promoted to the newly created post of executive vice-president. He will remain as secretary.

NATIONAL ALUMINATE CORPORATION — J. L. Gibboney, vice-president in charge of this company's Transportation Division, has been elected a director of the company.

POOR & COMPANY—Max K. Ruppert,

(Continued on page 70)

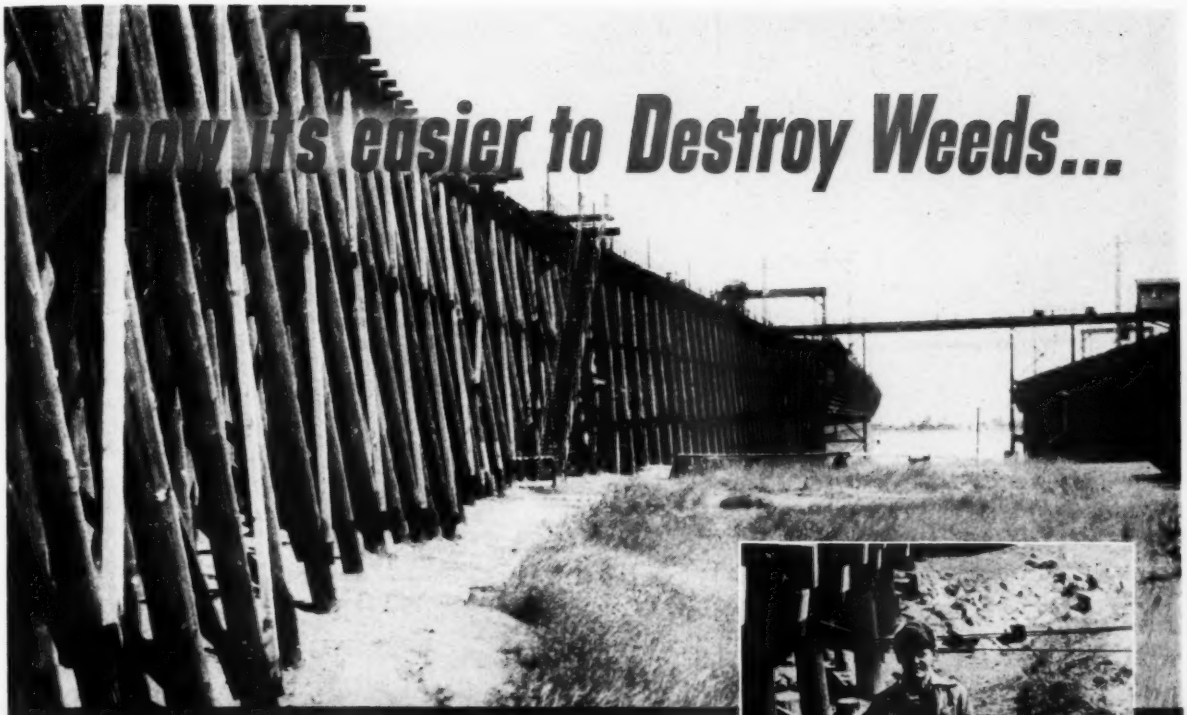
Don S. Permar
Le Roi

James R. Wilson
Mid-West Forging

Ray T. Johnson, Jr.
Mid-West Forging

Max K. Ruppert
Poor & Company

now it's easier to Destroy Weeds...



with ready-to-use, easy-to-apply

EFFECTIVE...ECONOMICAL

UREABOR®

WEED and GRASS KILLER

Here's your thriftier, easier way to stop weeds! Look in that hand and you'll see enough UREABOR to kill vegetation in a 12 sq. ft. area! Consider the convenience and economy this can mean to you. Consider, too, that a UREABOR "kill" remains effective for a season or longer. And UREABOR has important safety features; it is *nonflammable, nonpoisonous* when used as directed, and *does not corrode* ferrous metals. Protect your timber structures, yards and buildings from fire-hazardous weeds by applying UREABOR weed killer now... it's easier to apply!

Nothing to mix... no water to haul

One easy application—dry—may keep ground weed-free for a season or longer!

This special spreader for UREABOR makes application fast and easy...

The PCB Spreader applies UREABOR to best advantage, at prescribed low rates. It holds enough UREABOR to treat up to 2500 sq. ft. without refilling—weighs a mere 6 lbs. Available now for just $10.75 delivered—anywhere in the U.S.A.

Write today for complete information!

AGRICULTURAL SALES DEPARTMENT

United States Borax & Chemical Corporation

PACIFIC COAST BORAX COMPANY DIVISION

630 SHATTO PLACE, LOS ANGELES 5, CALIFORNIA

"Why didn't somebody tell me that Bird Self-Sealing Tie Pads could save $4.13 per cross tie?"

Perhaps you, too, need proof of how Bird Self-Sealing Tie Pads save you $4.13 per cross tie. Here are the facts:

The average installed cost of a new main line cross tie is approximately $7.00*. With a normal life of 20 years, this amounts to 35¢ per year.

Bird Self-Sealing Tie Pads increase the life of the average tie by at least 15 years. (This has been proved repeatedly by actual in-track installations.) At 35¢ per year, this saving amounts to $5.25 per tie.

The approximate cost of obtaining this saving is $1.12 — for two five-ply 7¾" x 12" Bird Self-Sealing Tie Pads. This gives you a *net saving of $4.13 per tie.*

Bird Self-Sealing Tie Pads are the *only* tie pads whose durable and effective seal with the tie has been proved through years of in-track service. For complete information, write Bird Tie Pads, Department HTS, East Walpole, Massachusetts.

*These figures represent the most conservative minimum. If your costs are higher, savings are proportionately higher.

Bird Self-Sealing Tie Pads Are Recommended For:

Bridge Decks • Curves • Switch Timbers • Highway Grade Crossings and Other Paved Areas • Crossing Frogs • Insulated Joints • With Smaller Tie Plates • Pile Cutoffs • Through Station Platforms • Out-of-Face Installations in Rail-Laying Programs • Locations where tie life is short or replacement costs are high.

Buy the Best . . . **BIRD & SON, inc.** Established 1795 *. . . Buy BIRD*

BIRD SELF-SEALING TIE PAD AFTER 5 YEARS SERVICE is removed for inspection. Pad had to be pried from tie owing to tenacious seal that is characteristic of all Bird Tie Pads. Reapplied, and becoming resealed after inspection, the Bird Tie Pad is good for many additional years of protective service.

You get EXTRA safety features and low maintenance with UNION Switch Stands

UNION T-20 and T-21* Switch Stands have a built-in circuit controller that prevents signals from clearing unless (1) the lock rod is actually locked and (2) the points are properly positioned.

Thousands of these switch stands are in operation. They are ruggedly built and require very little maintenance. They are being widely used to adapt track structures to higher train speeds. Ask any of our district offices for full details.

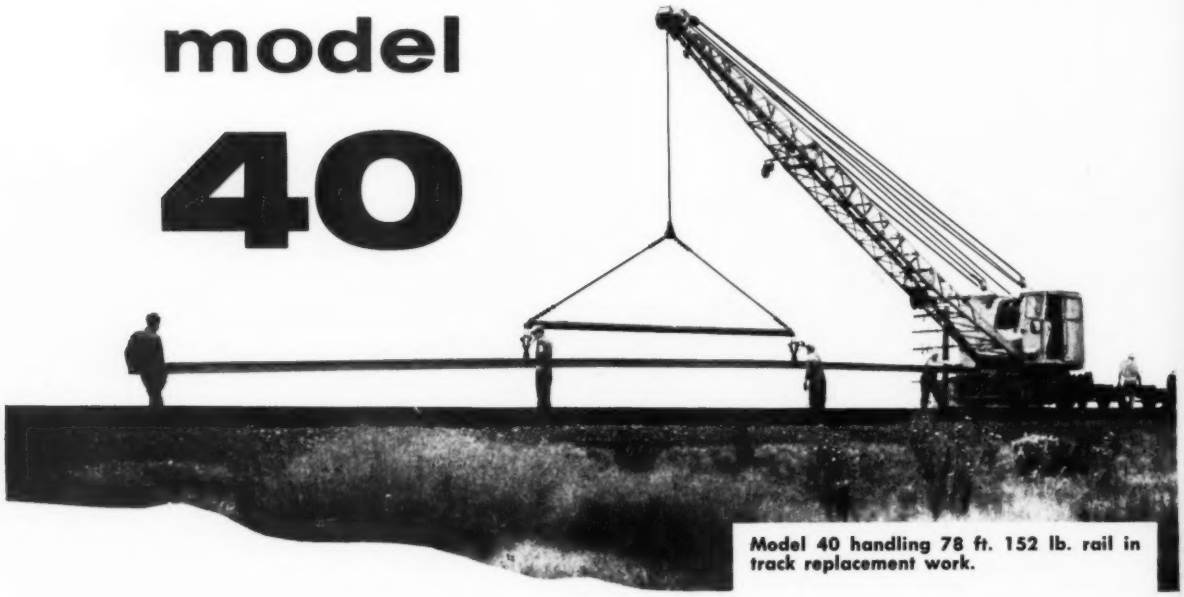
**UNION T-20 and T-21 Switch Stands are identical except the T-21 includes a built-in target drive assembly.*

PRIDED TO PROGRESS
RI
MEMBER

UNION SWITCH & SIGNAL
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
SWISSVALE, PENNSYLVANIA
NEW YORK.....PITTSBURGH.....CHICAGO.....SAN FRANCISCO

BURRO

model 40



Model 40 handling 78 ft. 152 lb. rail in track replacement work.

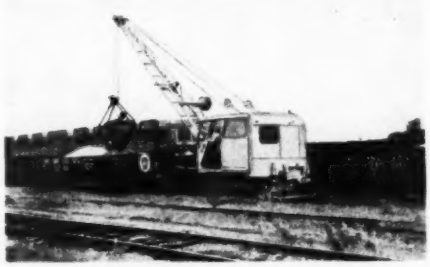
bigger . . . faster . . . more powerful

Already in service on a number of railroads, the newest Burro Crane . . . Model 40 . . . is proving itself to be as efficient and versatile as the Model 15A and Model 30 Cranes. Greater capacity, faster travel speeds and increased drawbar pull give the Model 40 a wider operating range and permit its use on more jobs with even greater operating economies. Also, the increased power and speed permit the Model 40 to be used for handling continuous rail.

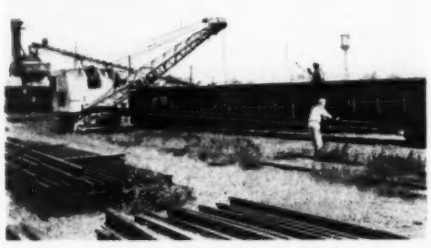
Model 40 Features:

- **12 Ton Capacity**
- **Travel speeds to 28 mph.**
- **9000 lbs. drawbar pull**
- **Improved air operated controls**
- **Compact design, short tail swing — will not foul adjoining track.**
- **Available with Booms up to 55 ft. long**

Write for illustrated brochure and complete details on Model 40 Burro Cranes.



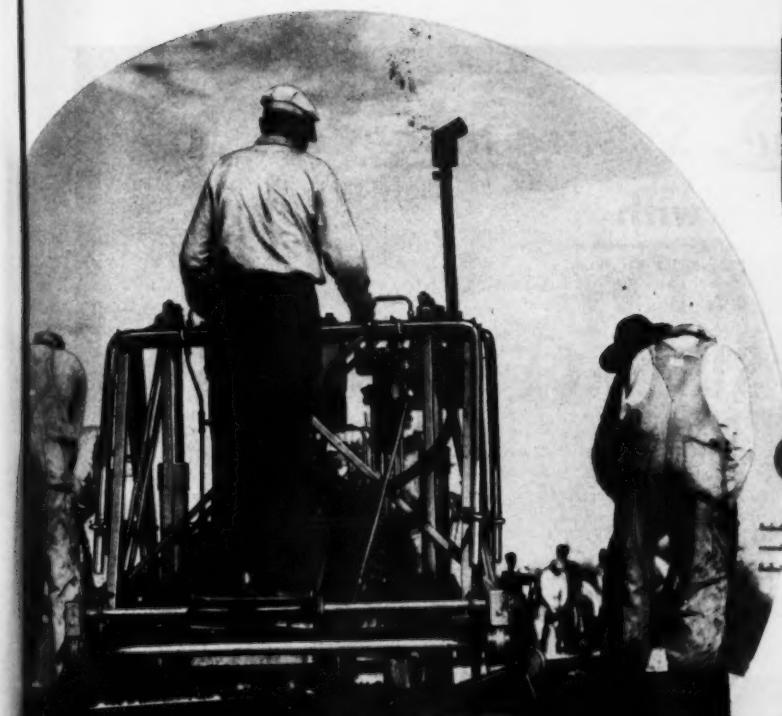
Equipped with clamshell bucket, Model 40 is a fast, efficient bulk material handling crane.

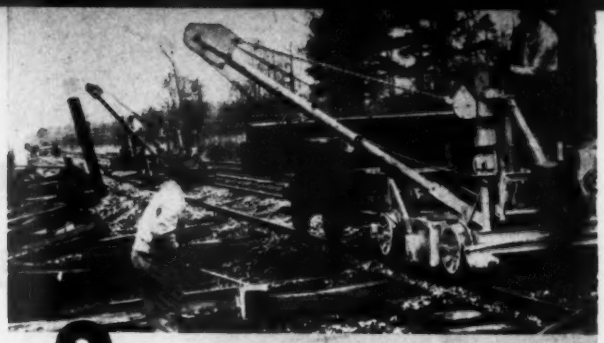


Loading rail. Model 40 will haul 6 to 8 loaded cars.

CULLEN-FRIESTEDT CO.

[illegible] SOUTH KILBOURN AVENUE • CHICAGO 23, ILLINOIS





4 WAYS

TO SAVE TIME AND MONEY ON TRACK MAINTENANCE OPERATIONS

... equip your gangs with these efficient NORDBERG "Mechanical Muscles"®

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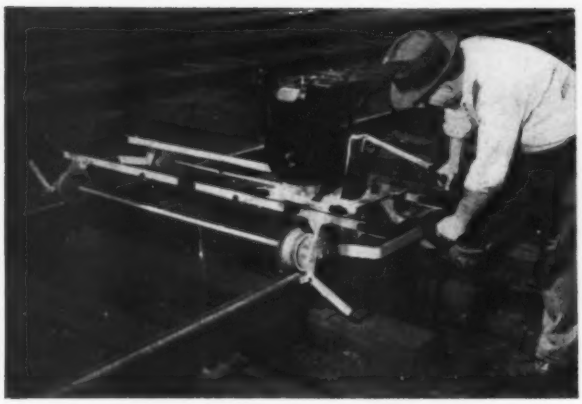

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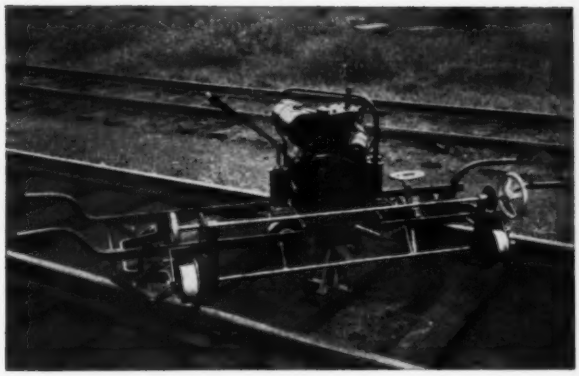

COMBINATION CROSS GRINDER AND SURFACE GRINDER. MODEL P-38—Economical—dual purpose—two grinder heads. Has narrow cutting wheel for slotting and removing overflow metal at rail ends, and straight 1¼"-thick wheel for surface grinding. Limiting device prevents track gouging while surface grinding. Special hand wheel permits back-and-forth oscillation of machine for grinding. Machine is light, portable, for quick handling under traffic. Clamping device holds track wheels tight to rail during cutting. Gears are totally enclosed. 6 hp air-cooled gasoline engine and grinding equipment are mounted on transverse carriage operating on ball bearings over steel guides.
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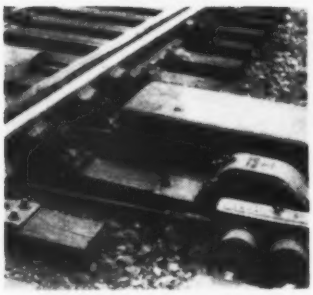

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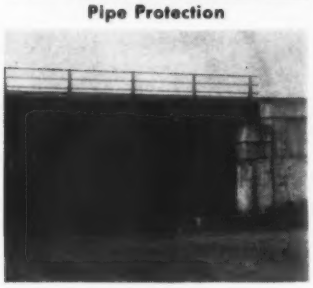

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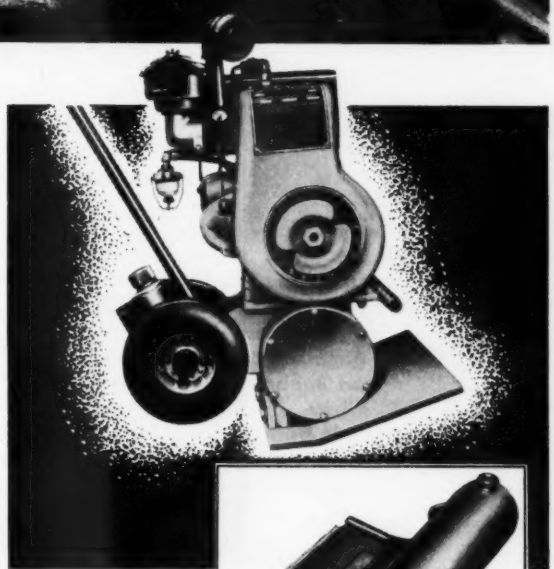

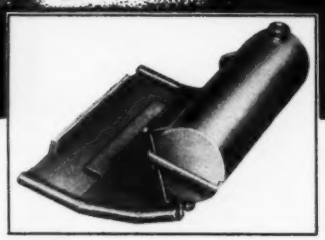

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RAILWAY
TRACK and STRUCTURES

Dear reader:

The foreman today — and tomorrow

The track foreman has probably been more deeply affected than any other supervisory employee by the revolutionary changes that have been taking place in railway track-maintenance practices in recent years. The effect on the foreman has come about because the changes, on some roads, have resulted in a virtual reorganization of the track department at the working-force level. As a consequence, many foremen have had to adapt themselves to conditions that are radically different from those they had been accustomed to.

Because conditions vary so widely from one railroad to another, we cannot draw a composite picture of the track foreman in his new status. But we can indicate some of the more common changes that have taken place. For instance, on many roads the foremen have longer territories than before. Many of them, although perhaps not a majority, have more men in their gangs than formerly. The chances are, too, that the average foreman has more machinery at his disposal than heretofore.

A great many foremen who once supervised section gangs with a variety of duties now find themselves in charge of highly mechanized gangs performing specialized operations. Still others are supervising the operations of multi-purpose gangs ranging over a district or even a supervisor's territory.

What, specifically, has been the effect of these trends on the duties and responsibilities of the foreman? For one thing, many of them have had to adapt themselves to the habit of thinking in terms of a larger territory. Others, with larger gangs to supervise, have had to enlarge the scope of their thinking in that respect, too. Foremen who once were primarily concerned with spotting operations have found it necessary to adjust their thinking to the requirements of fast-paced, out-of-face operations. Many of them have had to familiarize themselves with a greater range of machinery, and, in general, to think more in terms of mechanization.

There is no point in pretending that these changes that have occured in the lives of many foremen have always been pleasant experiences; in a great many cases they have not. Rarely is it easy for a person to adjust himself to an entirely new set of circumstances. But the foreman who has met the challenge squarely, and has been reasonably successful in adapting himself to the new order, has a right to be proud of his performance.

The chances are such a foreman has a better conception of the overall maintenance problem than he had before. He may also have achieved a closer identification with the thinking of his superiors. All of which means that he is probably a more important factor in his department than at any time in the past.

The track foreman has always been a key figure in the maintenance-of-way picture. What has happened in the way of changes that effect his status—and what is likely to happen in the future—are certain to add to his stature. This is a thought that foremen may wish to keep in mind when they encounter the challenges that lie ahead.

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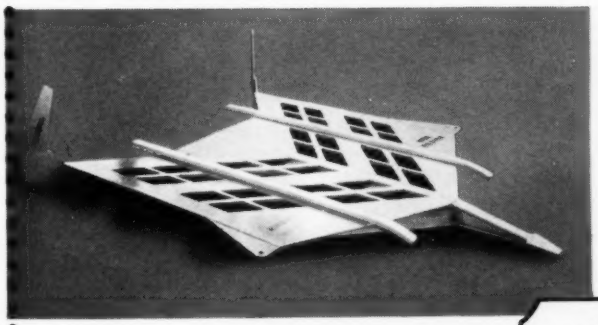

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TRACK and STRUCTURES

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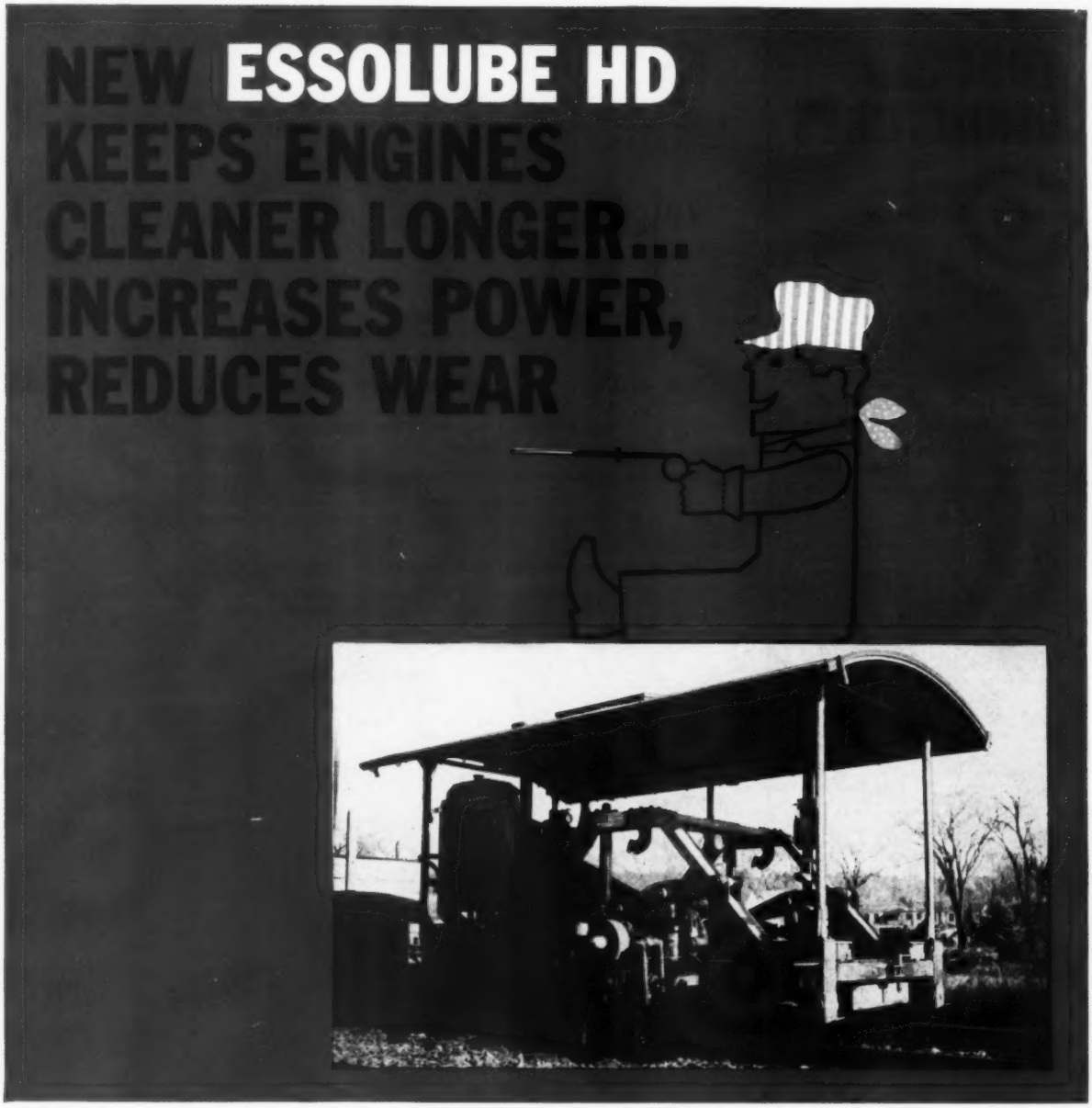
DON'T MISS . . .

Advocates of the lift-slab erection system say it offers many advantages over conventional poured-in-place construction for buildings. They claim it speeds up the work and also produces savings in cost. To check the accuracy of these claims, the Seaboard used the method in the construction of a new office building at Jacksonville, Fla.

. . . in the July issue

NEW ESSOLUBE HD KEEPS ENGINES CLEANER LONGER... INCREASES POWER, REDUCES WEAR



New Essolube HD is a superior lubricating oil developed for gasoline and diesel engines of the types used in maintenance-of-way equipment. New Essolube HD contains one of the most effective detergent inhibitor additives ever used. It offers new low-temperature detergency *and* improved high-temperature detergency, plus improved oxidation stability and bearing corrosion resistance.

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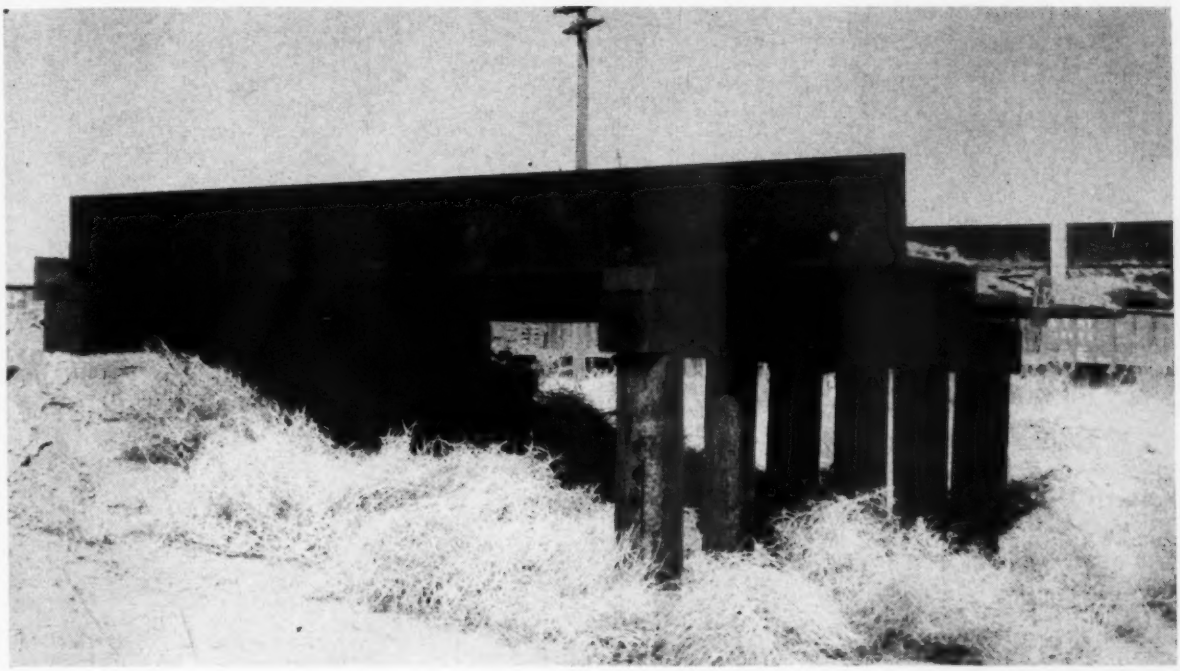
Chemical injected in wood with preservative produces . . .



. . . Timber trestles with built-in fire protection

The bridge in this view is a full-scale replica of a ballast-deck trestle treated with creosote-petroleum containing a triphenyl phosphate derivative. Turn the page to see what happened when the tumbleweeds were ignited.

Wood that sustains only minor surface charring when it is exposed to flames with temperatures of about 1500 deg F! That's the startling outcome of years of patient research aimed at making treated wood self-extinguishing.

• For many years, modern preservatives and treating methods have effectively protected wood structures against rot and insect attack. Fire, another enemy of wood, may be the next to lose its punch if work by the Santa Fe fulfills its present promise.

Santa Fe officers, who have been particularly concerned over the potential fire hazard in treated timber trestles, now believe they are close to the solution of this difficult problem. Recently completed field-scale burning tests indicate that self-extinguishing characteristics can be provided for these structures by adding a fire retardant chemical to commonly used wood-preservatives.

Bridge timbers treated with 12 lb per cu ft of a creosote-petroleum mixture containing 13.5 per cent by weight of a triphenyl phosphate derivative demonstrated impressive fire retardancy and resistance to flame spread. Cost increase for this protection appears to be reasonable (see next page).

Encouraged by these findings, the Santa Fe has entered into an expanded program in which lumber for two standard 10-panel trestles soon will receive fire-retardant treatment in commercial-size treating equipment.

Santa Fe confidence in the integral-treatment approach to fire-resistant trestles stems from more than four years of experimentation during which two realistic methods of fire testing have been developed. In one of these, the so-called overhead panel test, 3-ft by 14-ft experimentally treated panels inserted in a demountable insulated bridge structure were exposed to flames from burning tumbleweeds. These panels, which present a surface comparable to the underside of a ballasted deck trestle, were weighed before and after burning to estimate the damage they sustained.

Larger scale more rigorous fire tests of promising chemicals, including triphenyl phosphate and the

ALL SET for test, with tumbleweeds placed under bridge and around bent.

Bridge replica is enveloped in flames and

PEAK OF FIRE is reached about 30 sec after it is started. Much of smoke and flame is from

How Much Does It Cost?

The tests of triphenyl phosphate derivative on the Santa Fe have been made with full-scale replicas of ballast-deck trestles. Such structures built to this road's standard plan, and having piling 40 ft long, have an average of 32 cu ft of wood per lineal foot of single-track bridge. Practice on the Santa Fe is to treat bridge timber with a 50/50 creosote-petroleum solution to a retention of about 12 lb per cu ft. For ballast-deck trestles the triphenyl phosphate derivative is included in the treating solution in the amount of 13.5 per cent by weight. On this basis the added cost is about $13 per lineal foot of trestle.

At this point it is not possible to estimate the cost of treating material for open-deck trestles by this method. Further tests are now being planned to determine the concentration required for this type of construction. Tests are also contemplated to determine the requirements where bridge timbers, previously treated with preservative alone, are retreated to inject the fire retardant.

newer triphenyl phosphate derivative, have been carried out by incorporating them in full-size bridge-section replicas.

Throughout this work tumbleweeds have been used as a flame source due to the rapid, intense heat which they produce and because they represent a major fire problem on the Santa Fe. During full-scale testing, temperatures of about 1500 deg F are normally generated within 45 sec. Temperatures above 1000 deg F may persist for five to seven minutes, although the weeds are usually consumed within 70 to 90 sec.

Under exposure conditions of this type, experience indicates that an unprotected structure would be totally destroyed. Fires in bridge replicas treated with creosote-petroleum containing the retardant were virtually extinguished of their own accord, although isolated flickering in some cases persisted as long as 20 min. Maximum charring observed after such testing was approximately ¼ in.

Throughout three years of tests conducted cooperatively with the Dow Chemical Company, six potential fire retardants in a variety of concentrations and carriers have been studied. Panels containing two types of chemicals in both creosote-petroleum and penta-petroleum solutions were weathered for as much as two years before burning. Comparisons have been made between the performance of commonly used wood species as well as between vapor-dried and air-dried stock.

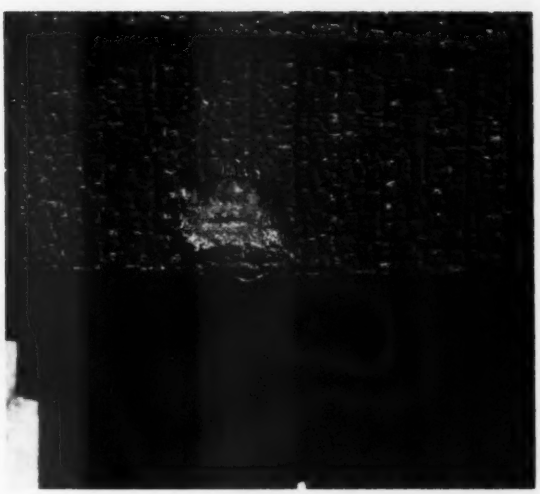
Of the many chemicals screened for this application, the oil soluble compounds of phosphorous have been most closely investigated since phosphorous oxidation products are well-known flame suppressants. This suppressant property appears to result from catalytic inhibition of chemical reactions associated with certain types of combustion processes.

However, many considerations other than fire extinguishing characteristics are involved in the choice of

smoke but fire is out 20 min after tumbleweeds were ignited

burning creosote and oil.

AFTER FIRE the tumbleweeds are gone but the bridge still stands apparently undamaged by the 1500-deg ordeal.



SCRAPED AREA after fire shows maximum char depth of 1/4 in. Note that incising marks are still clearly visible.

a practical fire-retardant chemical. Preliminary selections can be made based on phosphorous content and potential cost. Of equal importance are those qualities which relate to the permanence of the materials under service conditions. Solubility properties should be such that leaching cannot occur and the compound must not be depleted by evaporation.

Long-term chemical stability to both treating and weathering conditions is most critical since breakdown can diminish effectiveness and contribute to corrosion of equipment.

The material itself must be noncorrosive and relatively free of toxicological handling hazards. Moreover, the possibility that use of a fire retardant might reduce the service life of bridge structures either through dilution of the preservative or actual damage to the treated wood must always be considered.

Each of these problems has been carefully scrutinized by Dow as a part of its continuing research program in the field of wood-treating chemicals. It is reported that detailed studies of chemical stability show the triphenyl phosphate derivative to be the most stable material examined to date. The product is known by the trade name Arban 70.

What preservative value?

Its inclusion in creosote-petroleum mixtures appears to alter neither their corrosion characteristics nor the effect of these solutions on the strength properties of treated wood. Extensive research currently under way is designed to determine conclusively whether fire-retardant chemicals act only as diluents or whether such chemicals can actually be expected to contribute some preservative value of their own.

It appears that the pursuit of this fire-retardant development by the Santa Fe has contributed to the railroad industry a means of eliminating potentially costly and hazardous operating conditions. In addition, it is felt in some quarters that the availability of an effective fire-retardant material that can be injected with the timber preservative introduces a new factor in the long-standing controversy concerning the relative economic and practical advantages of timber versus other types of construction for railroad bridges.

NEW IDEAS RESULT IN

Cost-cutting methods

This was the situation:

You have a large mileage of yard tracks on which dirt and refuse accumulate rapidly. Years ago you reduced the cost of cleaning these tracks (formerly done by hand) by introducing a type of machine that picks up the material and deposits it into a train of push cars carrying dump boxes.

The push-car train is then hauled to a location where the boxes, each of which has a hydraulic dumping device, are dumped individually into side-dump hopper cars. The train of push cars then returns to the cleaning machine which goes back to work.

You want to reduce the cost of this operation still further. What would you do? The EJ&E found a way to cut the cost by almost two-thirds. This article tells how it was done.

DSL yard cleaner picks up refuse from track and loads it into the dump boxes.

Here's how job was done:

The matter of cleaning yard tracks is an important perennial problem on the Elgin, Joliet & Eastern, and the road is constantly striving to lower the cost of this work. Back in 1950, three of the road's maintenance officers collaborated in the development of a two-unit team of yard-cleaning machines, a sweeper and loader. Through the use of these machines and Converto dump-box push cars, the road cut the cost of yard-cleaning from $11.28 per cu yd for hand work to $4.37 per cu yd. These two machines were later combined into a single unit, which is now marketed by the Nordberg Manufacturing Company as the DSL yard cleaner.

The EJ&E has retired its original two-unit outfit and now owns four of the DSL yard cleaners. One of these is in operation at Joliet, Ill., another in South Chicago and two in the yards in Gary, Ind. Refuse picked up by each machine is deposited into Converto hydraulic-dump boxes mounted two to a car in a train of six push cars. The push-car trains are each towed by a Fairmont Class A8 motor car. These outfits work on a seasonal basis, starting in February, or shortly thereafter, and continuing work until freeze-up in November or December.

Gary is Biggest Cleaning Problem

The work force employed with these outfits varies according to local conditions. At Gary, the biggest and most difficult cleaning problem existed at the Gary steel mills. Here a great deal of dirt and refuse, such as broken pieces of refractory brick, iron-ore dust from flues, coke, slag, coal and mill scale from manufactured steel, is deposited on the tracks, as well as soil blown in from adjoining property. There are 300 miles of track to be cleaned in the mill area alone, and two of the DSL machines are assigned here. The locations at Joliet and South Chicago are not faced with the same problem and one outfit at each of these locations is capable of handling the cleaning work.

The two outfits at Gary each employ a foreman, and at times an assistant foreman, a machine operator, five laborers and two switchmen. The machine operator runs the DSL yard cleaner. He is assisted by a laborer in making on-the-spot adjustments in the heighth and direction of the conveyor boom and in the in-gathering wings of the machine. Another laborer levels the material in the dump

for yard-cleaning work

A TRAIN is made up of 12 Converto 2½-cu yd dump boxes mounted on push cars.

boxes while the machine is in operation. This man also signals the motor-car operator (a laborer) when to move the train. Two other laborers work ahead of the cleaning machine picking up objects from the track and intertrack areas that are too large for the machine to pick up. These are thrown into the dump boxes.

When level full, each dump box will hold 2 cu yd. However, when heaped, each will hold about 2½ cu yd so that the 12 boxes on the 6 push cars will normally contain enough refuse to fill one conventional side-dump hopper car. Shields of sheet iron are placed between adjacent dump boxes to prevent spillage between boxes while loading.

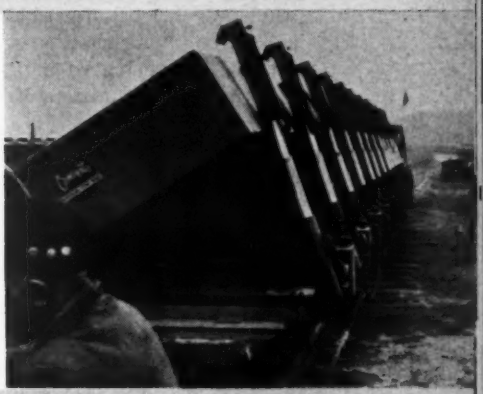
Until recently, when the train of push cars had been loaded, all of the men, except the machine operator, jumped aboard the motor car and the train was towed to a dumping spot at Broadway street in Gary. A depressed track and an adjacent inclined track had been constructed at this point, with the inclined track supported by a retaining wall built between the two tracks. The depressed track normally contains three conventional side-dump hopper cars of 50-yd capacity. A sheet-iron apron projects out from the upper tie level and over the near side of the hopper cars, to prevent spillage between tracks.

The train of push cars was pushed up the inclined track and stopped when spotted over the hopper cars. The men then lowered the sides of the dump boxes on the hopper side and operated the hydraulic hand pumps on the opposite side, causing the boxes to spill their loads into the hopper cars. After dumping, the boxes were pumped down, the sides raised and fastened in place, and the train returned to the yard-cleaning machine to repeat the cycle.

They now dump twelve Convertos in one operation

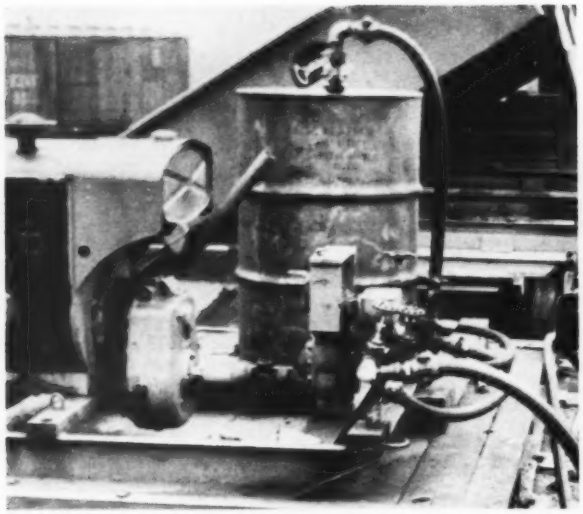
1 ONE TRAIN of dump boxes will fill a hopper car. Train is now ready to be dumped into cars.

2 AS BOXES are tilted, all at once, refuse spills out into the 50-yd. side-dump hopper cars.



3 WHEN actuated, the individual pumps raise one side of the Converto boxes, dumping them simultaneously.

4 FLUID is reversed in the hydraulic pump, and the boxes return to their normal level position.



POWER PLANT consists of a 14-hp Wisconsin engine direct-connected to a Converto pump delivering from 750 to 1000 psi.

PUSH CAR on which power plant is mounted is spotted at the end of inclined track. It is left there permanently.

When the hopper cars are filled, a switch crew pulls them from the depressed track, sets in three empties, and hauls the loads to a disposal area along the shore of Lake Michigan where the material is unloaded and spread in a low-ground area.

This plan of picking up and disposing of yard refuse worked well. Despite wage increase of 43 per cent since 1950 and the added cost of two switchmen, the cost of yard cleaning in Gary mill yard has been reduced from $11.28 per cu yd in 1950 to $5.08 in 1956, a reduction of 55 per cent. The yardage picked up has more than doubled in this period and hence a better job of cleaning has been accomplished.

Here's how they do it now:

But Roadmaster R. V. Dangremond was not satisfied. He noticed that the yard-cleaning machine was idle while the push cars were away being dumped. The yard cleaner is the pace-setter for the work, and it was not being fully utilized. He reasoned that, if another train of empty push cars were available, the yard cleaner could continue to work while the first train was being dumped.

He also noticed that considerable time was required for the men to operate the pumps for raising and lowering the boxes when dumping. He reasoned that this operation could be speeded up by connecting the hydraulic pumps on all the boxes in tandem and installing a gasoline-engine-driven hydraulic pump so that the boxes could be dumped simultaneously.

After consultation with Brice Hayes of the Brice Hayes Company, which represents the manufacturer of the Converto units in the railroad field, and H. E. Skinner, the road's supervisor of scales and work equipment, it was decided that the plan was feasible and could result in the yard-cleaning costs being substantially reduced. Authority was granted and the project was undertaken.

Six more Fairmont Class 113 push cars and 12 Converto dump boxes were purchased and the boxes were mounted two to a push car as before. Hydraulic hose was used to couple the hydraulic pumps of the boxes together in series. A new Wisconsin 14-hp gasoline engine was direct-connected to a new Converto hydraulic pump, which is capable of producing from 750 to 1000 psi in the hydraulic fluid. The engine and pump were mounted on an old push car, together with a 55-gal oil drum which serves as a fluid reservoir. A timber platform was built at the end of the inclined track, on which is spotted the power unit.

The new equipment has only recently been put into service and the men are getting accustomed to their duties. As before, the yard cleaner works on one track and the train of Converto push cars on an adjacent track. When the dump boxes are heaped full, the motor car pulls the loaded train a short distance away and sets in the train of empty dump boxes. The motor car then hauls the loaded train to the dumping spot. It is only necessary for the foremen, motor-car operator and two laborers to accompany the loaded train for the purpose of lowering and closing the sides of the dump boxes and for operating the power unit.

While the loaded train is being dumped, the yard cleaner loads the empty boxes. If this train must be moved before the motor car returns, the yard cleaner pushes it by means of a long pole.

It requires about an hour for the yard cleaner to load a train of dump boxes. The dumping time cycle will, of course, vary according to the length of haul, the number of switches to be thrown, and the interruptions caused by switch engines. However, it is estimated that the cycle will range from 20 to 35 min. This will enable the motor car to get back to the yard cleaner before it completes filling a train.

When operating only one train of dump boxes, the Gary outfits averaged the filling and disposing of about 40 hopper cars a month. With the new arrangement, the road expects to raise this output to about 115 hopper cars a month. It is too early to tell exactly how much the average cost per yard will be, but the road is confident that the cost will be halved. After verification of savings consideration will be given to further expansion of the system.

How to replace a busy turnout

▲ This is the turnout just before the work was started.

Renewing turnouts is a routine operation. The track forces are doing it all the time, and every supervisor or foreman has a more or less set procedure he follows.

On these pages is an account of how the job is done on the Chicago Terminal division of the Illinois Central. Perhaps others will find ideas here for improving their own procedure. Or perhaps they will see ways where the system described could be improved.

What will you find?

• How do you go about renewing a turnout?

Just where do you begin and what sequence of steps do you follow?

We put these questions to J. H. Megee, division engineer of the Chicago Terminal division of the Illinois Central. He explained that H. A. Depperman, one of his supervisors of track, was an expert on turnout installation and suggested we find out from him how it's done. The result was that arrangements were made for an *RT&S* editor to be present at Broadview, Ill., during the replacement of a turnout connecting a yard switching lead, which also serves as an Indiana Harbor Belt transfer track, with the IC's main track to Omaha, Neb. This turnout was a 90-lb No. 10 and was to be replaced with a 112-lb No. 10 turnout.

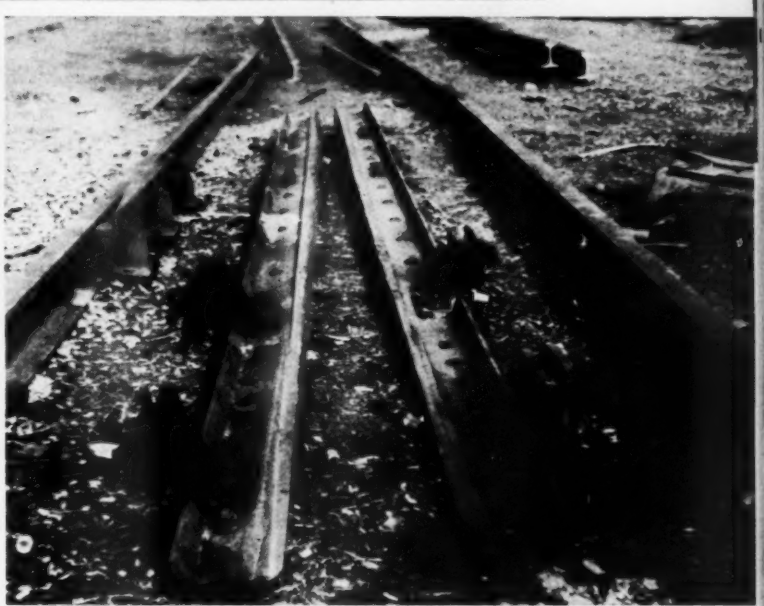
Get early start

The editor, who had been cautioned to be on the ground early because the morning hours provided the least number of traffic interruptions, was on hand at 7:10 am. Supervisor Depperman was already there checking with the trainmaster on the trains which could be expected. The trainmaster had previously

This is the sequence followed in doing the job. ▼

Turn page for other steps in pictorial sequence

1 ALL material for a complete SH 112-lb No. 10 turnout was unloaded at site; some units were preassembled.



2 CLIPS were hung on points, switch-point protectors and heel fillers on stock rails and guard rails on running rails.

After track is "killed," the straight rail is removed first

3 WHILE turnout is still in service, some spikes and bolts are removed.

4 STRAIGHT side is removed first, followed by the curved closure rails.

5 STRAIGHT rails, bars, insulated joints and plates are then applied.

Stock rail and left switch point, and closure rails, go in next

8 STOCK rail and attached short rail to crossing are laid on larger plates; left-hand switch point is installed.

9 CLOSURE rails, previously coupled together with insulated joints, are laid in place on 112-lb tie plates.

discussed this work with the supervisor and was now making arrangements with the IHB for holding off transfer deliveries until after 10:30 am. He had also made arrangements with his yard-switching crews to do most of their early work from the other end of Broadview yard.

While Supervisor Depperman was waiting for permission to take the turnout out of service, the editor walked out to the turnout. The track gang had already assembled at this point. It included the section foreman, 13 trackmen, a welder and his helper, and a signal maintainer and his helper. The latter two men were on hand to raise and lower the crossing gates at heavily traveled 17th Avenue and to remove and replace the signal bonds and connections. The welder and his helper were cutting half of the bolts and the trackmen were removing the spikes from every other tie.

It was observed that all material for a complete turnout had been unloaded at the site in position where it would be handy for installation. Heel fillers had been hung on the stock rails, guard rails were attached to the outer running rails, a switch-point protector was mounted on the straight stock rail, the two short rails needed ahead of the switch to connect with the rails through 17th Avenue crossing were already connected to the stock rails, and the insulated joints had already been applied to connect the two rails behind the stock rails.

At 7:30 am., permission for "killing" the turnout to traffic had been granted and Supervisor Depperman took over direction of the activities.

Line side is completed first, and then other side is removed

6 RIGHT-HAND switch point is installed and straight rail is spiked while welder cuts bolts on opposite side.

7 SWITCH rods are removed, switch point is detached, head block ties are tightened up, and turnout side is torn out.

Then the old frog is taken out and new one is moved into position

10 OLD FROG is removed, ties are adzed for long hook plates, and new frog is slid in sidewise on rail skids.

11 NEW FROG is flopped over and barred into place. The frog point is gaged, frog alined and spiked in place.

First, the straight rails of the old turnout were removed from the end of the rails through 17th Avenue crossing to the joints behind the frog. The clip bolts on the right-hand point were torch cut and the spikes pulled from the slide plates. The right-hand point and the curved closure rails were removed, and tie plugs were inserted and tapped down. The straight stock rail, with its attached short rail to the crossing, was laid and partially spiked on new plates.

While the right-hand switch point was being installed, the running rails on the straight side, together with the attached guard rail, were placed in position and partially spiked. The switch point was blocked in the open position and temporarily spiked. The curved closure rail behind the point was then laid on its plates but not spiked.

At this stage of the work, the track was now available for an IHB transfer movement or for use as a switching lead if occasion had demanded. However, since the turnout was "killed" to traffic until 10:30 am., work was begun on the dismantling

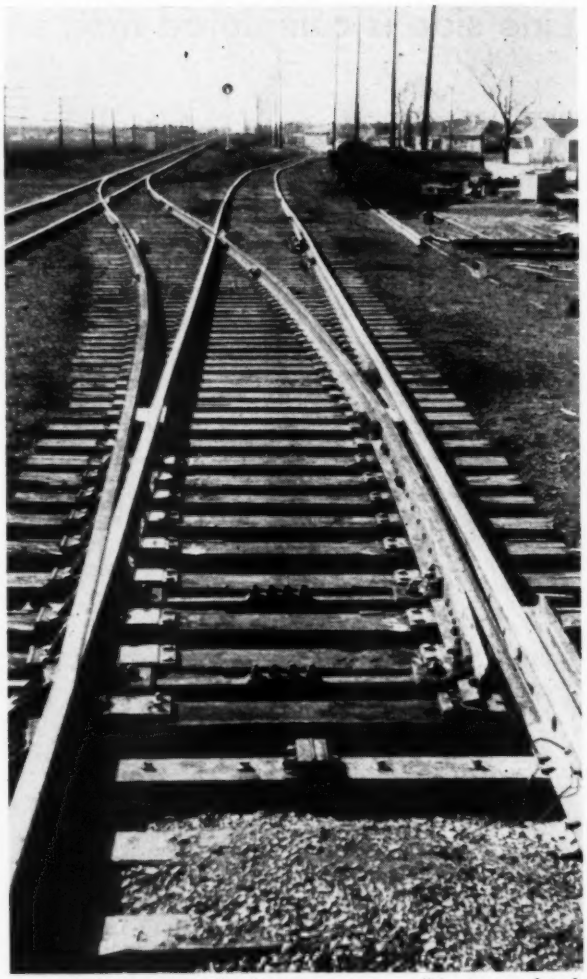
More on next page

of the bent stock and curved turnout rails as far back as the existing compromise joints, and on removal of the left-hand switch point and straight closure rails. The old slide and tie plates were removed, spike holes plugged, and the work of rebuilding this side was begun. New plates were applied, the new bent stock rail with its attached short rail to the crossing was installed, and the straight closure rails and the inside turnout rails were laid.

. . . and job is completed

12 OFFSET measurements from straight rail are made at two locations so curvature will be according to plan.

13 SCREW SPIKES are applied on gage and slide plates, as well as guard-rail plates, with power impact wrench.



14 OTHER turnout rail is brought to gage, spiking is completed, signal bonds are applied, and turnout is ready for traffic.

Spikes were withdrawn from the existing frog and it was moved to one side. The frog ties were adzed to accommodate longer frog hook plates. Meanwhile, two skid rails were placed over the straight rail and extended laterally to the new frog. The latter was raised onto the skid rails, skidded sidewise and flopped side over side to come to rest upright at about its final position.

The frog was moved by bars to butt against the straight closure rail and to proper gage from the straight running rail, and spiked. The short adjacent curved-closure rail was cut to fit, bolt holes were drilled and it was bolted in place.

The road's standard 112-lb No. 10 turnout plan was then consulted and offset measurements made accordingly at two points between the heel of switch point and toe of frog to fix the curved closure rail at proper curvature. This rail was then spiked at these points and lined and spiked between them from the heel of switch point to the toe of frog. After fixing this rail, the opposite turnout rail was gaged and spiked.

Adjustments made at points

While this work was being carried out, other rails were cut to fill the gaps behind the frog as well as on the inside turnout rail. The existing headblock ties also were adjusted to the new points, signal rods were reapplied and the connecting rod, adjustable braces, and switch stand were adjusted.

The new turnout was now in place, and at 10:15 am., an IHB transfer movement was made through the straight side of the turnout. However, further work was required to complete the job, which work was done under traffic. It included the installation of abrasion plates and tie pads under the insulated joints; the application of screw spikes to guard-rail plates and the gage plate; the application of rail anchors; the completion of the spiking; the building up of the rail ends, where required; and the picking up and piling of the removed material. This work was all completed by 3:30 pm.

Power machines used on this job included an impact wrench powered by an electric generator, which was used for driving down the screw spikes, a power track drill, and a power rail saw. Supervisor Depperman explained that the expense of a rail crane could not be justified either for the unloading or laying of this material.

Management thinking veers towards

M/W programs you can count on

Maintenance officers have long held that "stop and go" maintenance is basically wasteful, that there would be economies and other advantages in a policy of programing M/W operations on a "firm" basis for the entire year.

A survey by *RT&S* shows that the managements of some roads have not only become convinced that "firm" annual programing is desirable but are actually thinking in terms of programs projected several years into the future.

What some managements are thinking about M/W programing . . .

. . . On monthly basis	. . . On firm annual basis
Prevents precise scheduling of operations	Makes precise scheduling possible
Interferes with orderly conduct of work	Assures work will proceed in orderly manner
Promotes instability of working force	Promotes stability of working force
Results in inefficient use of men and machines	Assures efficient use of men and machines
Reduces morale of supervision and workers	Builds morale of supervision and workers
Causes added expense of recovering distributed materials	Eliminates expense of recovering distributed materials
Results in higher unit costs	Lowers unit costs through higher over-all efficiency
Makes proper maintenance difficult	Assures attainment of desired maintenance standards

• Are you as an M/W supervisory officer fearful that your allotment for a particular month or job may be drastically cut?

If so, there's cause for cheer in an apparent evolution that is taking place in the attitude of railroad management officers toward the programing of maintenance of way and structures work. This change has been slow in coming, and it cannot yet be said it's widely prevalent. But it has become deeply rooted on some roads, and there's reason to believe others are leaning toward it.

What is happening on these roads is that, with managements' full approval, heavy maintenance work (tie renewals, ballasting and surfacing, rail laying, etc.) is being programed on a "firm" basis for the entire year with the understanding that nothing less than extremely sharp fluctuations in traffic will be allowed to interfere.

Maintenance officers have long recognized the evils of doing M/W work on a "stop and go" basis, i.e., tying monthly allotments to current fluctuations in traffic. But as long as management insisted on this policy there was nothing maintenance men could do about the situation except to adjust themselves and their work to it as best they could.

Now we find here and there, a representative of management raising his voice against the old policy and extolling the advantages of "firm" programing. "A dollar saved at the expense of physical plant can be the poorest dollar you ever laid your hands on," said D. W. Brosnan, executive vice-president of the Southern, in an address some time ago. He advocated a "steady, stretched-out maintenance program" wherein a relatively stable maintenance force works on a carefully regulated schedule.

Cyclical rushes of work and layoffs, that result when the maintenance dollar is used to balance the budget, produce many undesirable effects, he declared. "In the rushes you must hire temporary help. It is always poorer, inexperienced help and it is therefore, poor economy. Stable work produces stable workers and among stable men you are far less apt to have labor difficulties."

Many M/W men will say that Mr. Brosnan was echoing the very sentitiments they have held for many years. But he was also reflecting the thinking of management on a growing list of roads. This thinking is being influenced by several factors. One is a growing conviction that the performance of such work on a cyclical basis is most economical in the long run. If this method is to work successfully, the cycles can be stretched out but they can't be seriously disrupted. Advocates of cycle maintenance point out it not only stabilizes and systematizes but it also promotes efficient use of machinery. Management thinking is also being influenced by the growing pressure to bring about a higher degree of stabilization of the maintenance-of-way forces.

Finds favor on the D&H

The Delaware & Hudson is another road on which the new approach to maintenance programing has taken root. "One of the greatest advantages to establishing a yearly maintenance program," says J. P. Hiltz, Jr., vice-president operations and maintenance, "is that which accrues from being able to schedule, in advance, the use of labor, material, machinery, and services. By so doing, inefficiencies are reduced to a minimum and utilization is raised to a maximum. Further, the various operations follow in a planned sequence, and thus maximum effectiveness of each operation is attained without encountering destructive duplication of effort.

"This type of scheduling cannot

be carried out on a month-to-month basis. There is too long a period involved in scheduling services, making equipment available, assembling personnel and delivering material to turn these operations on and off at the whim of minor traffic fluctuations without encountering waste.

"Except in rare instances, our traffic forecasts should be sufficiently accurate to allow the establishment and preservation of a yearly budget to accommodate basic maintenance items. The total yearly budget can be increased or decreased with traffic fluctuations and income tax considerations by varying the program to increase or decrease the amount of non-basic or 'desirable but not essential' items."

This opinion is based on the premise that "it is possible . . . to determine, for a given period, the quantities of the various types of maintenance necessary to properly perpetuate a railroad property. These quantities, of course, will vary slightly with traffic fluctuations, but for practical purposes, unless traffic fluctuations are extremely severe, they will remain constant. Unless this amount of maintenance is performed in each period, a railroad management deceives its stockholders, the people who depend on the railroad for service or a livelihood, and itself."

Long-range planning

Is it practicable to chart maintenance programs several years in advance? A number of top officers feel that such programing is not only practicable but is actually desirable. One of these is M. I. Dunn, vice-president-operations, C&O, whose opinions on the subject are given in the box on this page.

From a purely maintenance standpoint long-range programing is highly desirable, says Mr. Hiltz.

"Practically," he adds, "the income tax consideration is so strong for certain companies that year-to-year variations in maintenance programs are unavoidable if a proper financial course is charted. If properly administered, however, the undesirable effect of these year-to-year variations can be minimized. If the long-range objective is kept in mind, maintenance costs, efficiency or effectiveness need not be impaired.

"In other words, just because the income tax 'cycle' is based on a one-year period is no reason why this maintenance 'cycle' should be tied down to the same period. The danger, of course, is that tax savings made in one year are quickly forgotten insofar as maintenance is concerned with the result that the long-range cycle is not maintained or is made too 'long range.' "

What are the results?

How does "firm" annual programing of M/W operations work out in actual practice? For an answer to this question, we turn to G. A. Philips, chief engineer of the Lackawanna. "We have been doing this on the Lackawanna since 1940" he explains. "Our maintenance-of-way ratio since that year has averaged less than 10 per cent, not including depreciation and retirements. I will leave the physical condition of the property to the judgment of the observer.* It seems to me that this combination of facts clearly supports an annual budget without month-by-month fluctuations depending on traffic.

"Of course, if a serious emergency occurred, such as total paralysis of business by reason of a strike, any kind of a budget would have to be upset."

Mr. Philips points out that this type of programing makes it possible for the maintenance forces to prepare a detailed book chart listing all operations and the dates on which they will be started and finished. "We adhere to it as one would the Bible," he says. "I can hardly recall when a budget has been changed after once having been decided upon."

* Track men from other roads have frequently remarked that track on the Lackawanna conforms to high standards of maintenance.—Editor

Long-range programing on the C & O

Is it practicable, or even desirable, to chart maintenance-of-way operations several years in advance? Here's what M. I. Dunn, vice president-operations, C&O, has to say about this question.

"It is my firm opinion that programing should be on a continuing basis, extending over a number of years on a basis of recurrent cycles. Coupled with this continuing program must be constant re-evaluations of anticipated revenue and traffic volume. Annual maintenance budgets should be firmly fixed prior to the beginning of each calendar or fiscal year, but this is something quite apart from the actual programing.

"As I see it, the program as to successive cycles of maintenance can and should be fixed for as much as five years in advance based on anticipated traffic and revenue levels. Once fixed, the program should not be disturbed except where patterns of traffic change.

"The rate of progress of the programed maintenance can be redetermined from time to time in the light of economic necessity, but the program should remain unchanged. To illustrate—a cycle program extending over five years might well be speeded up because of increased traffic, to complete the cycle in four years. Similarly, it might be necessary to extend it to six or seven years under conditions of depressed traffic.

"Budgeting under programed maintenance procedures, increasing or decreasing budget expenditures as may be dictated by necessity, should be made on the basis of equalization or proration of cuts or increases over the 12-month period following the month in which the budget must be adjusted. To illustrate—if it became apparent that a 10 per cent cut in the maintenance budget is desirable the cut should be made pro rata over the succeeding 12 months, but the program should remain unchanged except as to the target date for completion.

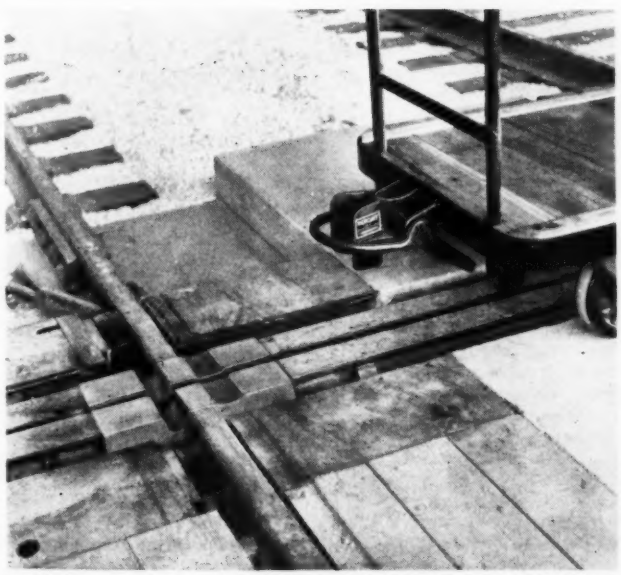
"Such programing and budgeting necessitate a predetermination by top management of the state of maintenance at which it is desired to keep the property. By programing over a long-range period and avoiding radical deviations from the budget by equalization over 12 months, confusion, and waste attendant on violent fluctuations of the maintenance level are avoided.

"I have the firm conviction that it is possible for any railroad to plan its maintenance activities a number of years in advance and to stick to this plan in detail. The only variable really necessary is the rate of accomplishment of the plan."

They needed more light...

GOODBY GLOOM is what they were saying at Murphy Motor Freight's freighthouse at St. Paul, Minn., recently following the installation of Corrulux skylights. Prior to the modernization (left) outside light from the open doors caused sporadic glare spots on one hand and shadows and sectors of poor illumination on the other. Strips of fluorescent lighting were reported ineffective. After the installation of the skylights (above) light is said to be uniform down the center of the building and the open doors presented no glare problem.

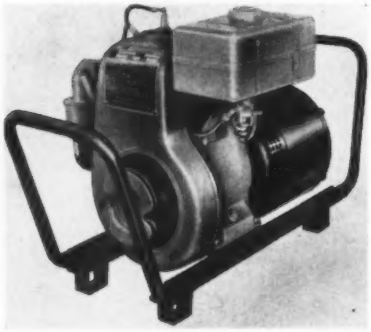
News Briefs in Pictures...



TOWLINE track intersection problem at Santa Fe's Corwith freight yards, Chicago, was solved by using a slotted manganese steel track section and rubber inserts. Developed by the Mercury Manufacturing Company, the design makes possible the smoother handling of towline trailers without worrying about track crossovers.

MAINTENANCE-FREE for the past four years is the record that has been compiled by this Blaw-Knox grating-type crossing installed at the Woodings-Verona Tool Works at Oakmont, Pa., in 1953. "The grating has long since paid for itself in improved relations with the motoring public and absence of maintenance costs," said Mr. Woodings, W-V president.

Products



Close voltage control for . . .

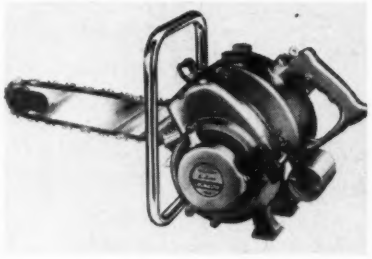
Portable generator

CLOSE voltage regulation and a generous overload capacity are said to be among the features cited for a new 3,000-watt electric generator. Designated Model 41, this generator is light in weight for carrying from one job location to another for operating electric drills, saws, pipe threaders, hammers, floodlights and other electric tools. The manufacturer states that this generator was developed for use by contractors, builders, plumbers, and electricians as a portable power unit for supplying dependable power for floodlights, portable electric tools and emergency stand-by service. Model 41 is powered by a gasoline engine and is said to be simple in design for minimizing maintenance costs. It has no BC brushes, commutators, dc windings or intermediate couplings. *Homelite, Dept. RTS, Port Chester, N.Y.*

45-ton capacity for . . .

'Light' truck crane

PRODUCTION on a new 45-ton capacity truck crane weighing 90,080 lb has been started by the manufacturer. For critical moving conditions, the manufacturer points out, the total weight of the unit can be reduced to 67,100 lb by removal of booms, counterweight and outrigger beams. Designated as the Model 445, the crane can use up a 120-ft boom. Straight boom jibs, 15, 20, 25 and 30-ft long with cable, are available for special high-lift crane service. Safety boom limit stops and power boom lowering are standard equipment. Powered by a Waukesha 145 GKB engine that delivers 214 hp at 2,400 rpm, the truck has eight speeds forward—four in main and two in auxiliary. Top speed is 31.8 mph. Truck chassis, mounted on a 220-in wheelbase, is 10 ft 1 in wide and 30 ft 2½ in long. Tires are 14.00 x 20—18-ply. *Koehring Company, Dept. RTS, Milwaukee 16, Wis.*



New all-purpose . . .

3½-hp chain saw

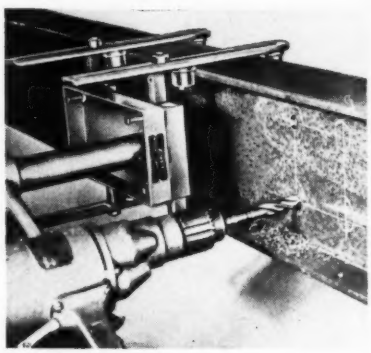
A NEW gasoline-powered direct-drive chain saw in the all-purpose, 3½-hp class has recently been placed on the market. Named the Silver "Logmaster," the new lightweight model is a companion product of the recently announced Golden "Logmaster" chain saw and incorporates all its major design features, including an exclusive roller-bearing nose which, the manufacturer claims, boosts cutting power by 20 per cent and reduces friction to give longer wear. Other features of the new saw include: A fully-protected air filter with push-button release; a fuel-finder gasoline pickup; built-in spark arrester muffler; pressure-sealed thumb-button oiler; corrosion-proof brightwork, knurled tank caps with ring seals; and silver-metallic finish. The new saw is available in 18, 24 and 30-in bar lengths. *Mall Tool Company, Dept. RTS, Division of Remington Arms Company, Inc., Bridgeport, Conn.*

Full season control with . . .

New herbicide

MOST annual and perennial grasses and broad-leafed weeds in non-crop areas can be controlled for a full season by the use of a new granular chemical herbicide, according to its manufacturer. Designated Urox Weed Killer, this product is designed for dry application with simple inexpensive equipment. The major advantage of Urox is said to be its ability to give lasting control over an extended period. In many instances, a single application of this herbicide is reported to have given continuous killing action for more than 10 months, and booster doses keep most areas weed-free from season to season.

Urox is a granular formulation of 3-(p-chlorophenyl)-1, 1-dimethylurea trichloroacetate. The product, it is said, does not add to the flammability of weeds and can be used safely around oil, gas and similar installations, as well as on the right of way, yards, storage areas and along fences. It is available in fiber drums of 100, 50, or 20-lb capacities. *General Chemical Division, Allied Chemical & Dye Corp., Dept. RTS, 40 Rector St., New York 6.*



Railroad applications for . . .

Portable drill

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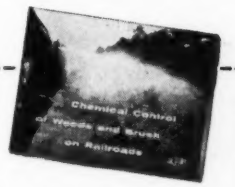

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DEADLINE: July 31

1. When installing a turnout from a curved main track where the curvature of the main is approximately equal to the curvature of the turnout and opposite in direction, should both stock rails be bent ahead of the switch point? If not, why not? Explain.

2. Is all-welded construction practicable and economical for steel railroad bridges? Does it have advantages over riveted or bolted construction? Disadvantages? Explain.

3. What factors determine the ratio between the number of turnouts in a yard and the amount of replacement material — frogs, switch points, etc.—which should be stored in the yard area? Explain.

4. What are the advantages of prefabricated buildings for railroad service? To what particular applications are such buildings best suited? Explain.

5. Is it practicable to fuel diesel locomotives indoors? What are the advantages? Disadvantages? What precautions must be observed? Explain.

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Filling tires with liquid

Some roads, to gain additional weight on the traction wheels of pneumatic-tired work equipment, follow the practice of filling the tires with a liquid. What are the advantages and disadvantages of this practice? What liquids should be used? In what proportion to air? Explain.

Better than chains or weights

By A. W. Munt
Supervisor Work Equipment
Canadian Pacific R.R.
Toronto, Ont.

In my opinion the main advantage to be gained in filling tires with liquid is that it improves the tractive effort considerably by increasing tire weight about 85 per cent. This increased traction is not only a great benefit during summer use but it is particularly beneficial during the winter months when the equipment has to be worked in snow or under slippery conditions. The adding of the extra weight of the liquid in the tires puts the weight where it is essentially required and its application does not damage the tires as chains often do.

It would seem that about the only disadvantage to be encountered when tires are filled with liquid is that it makes extra work when tires have to be removed for repairs. In this case it is necessary to drain off the liquid completed. This increases tire repair each time and refill after repairs are costs.

The liquid generally used in tires is calcium chloride. The proportion to air to be added to a tire is 85 per cent calcium chloride and 15 per cent air. Depending on the size of the tires, this proportion of calcium may increase the weight of the tire by several hundred pounds, and advantages to be gained by this extra weight are self-evident as it provides a method of adding weight without attaching bulky objects to the wheel hub such as wheel weights, etc.

According to tire manufacturers the use of calcium chloride has little, if any, detrimental effect on the tire but it will cause rust to form on exposed metal parts if allowed to remain. Metal parts affected should be washed off with clear water after tire filling has been completed. Calcium chloride will not freeze.

Fill to 90 per cent of volume

By Paul Martin
Methods Engineer—System
New York Central
Cleveland, Ohio.

The liquid in general use is a calcium chloride solution of sufficient strength to maintain it as a liquid, during sub-freezing temperatures in the area where the equipment is to be used.

The tires are filled to about 90 per cent of the volume capacity. The remaining 10 per cent of the volume should be inflated with air to the normal recommended pressure. This air space is very important to permit proper flotation of the tire. Completely filling the tire with liquid will produce about the same results as a solid tire in respect to the area of ground contact and riding properties.

The advantages of using liquid in traction tires are as follows:

(1) The increased weight promotes greater pulling power because of the better ground grip of the tires;

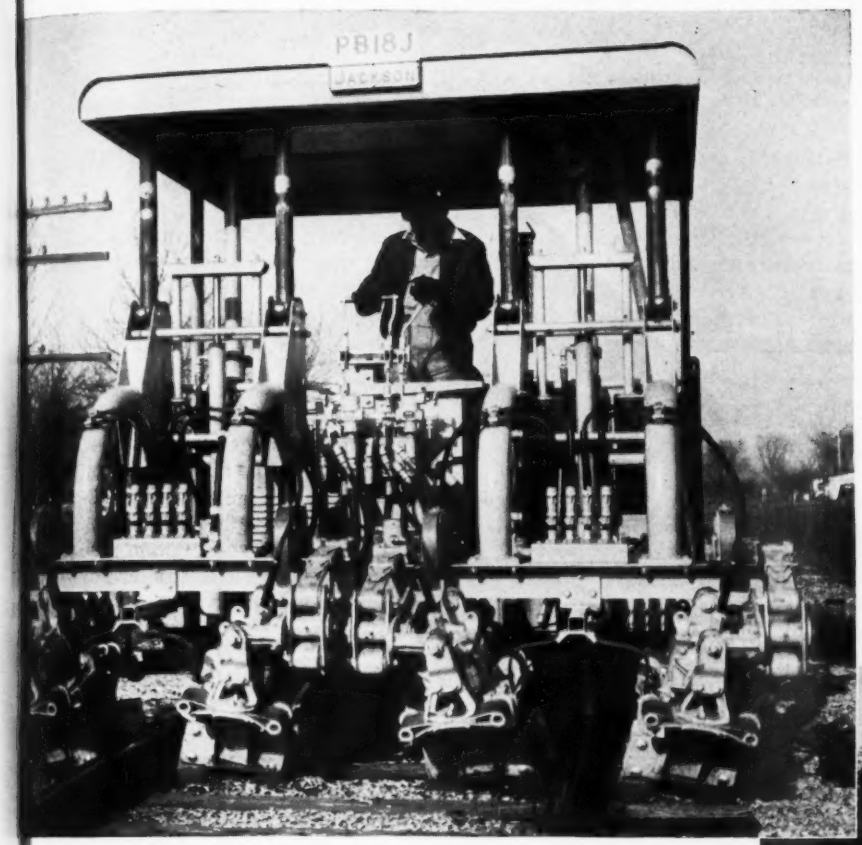
(2) Increased tire life can be expected by reduced slippage of the tires;

(3) Better riding qualities as a result of the increased weight which reduces the bounce, of the unit, on rough ground;

(4) This method of applying additional weight, to a piece of equipment, is not costly and does not alter the appearance or the overall measurements of the unit, as sometimes results when fabricated metal or cast weights are applied.

The disadvantages of using liquids in traction tires are as follows:

(1) The repair of tires on equipment in inaccessible locations would present a decided problem. It would either be neces-



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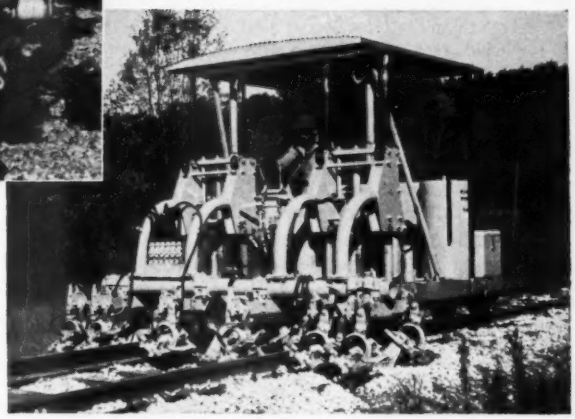

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sary to insert the liquid before taking the tire to the equipment or to transport the liquid in a drum, or drums, plus the special pump and apparatus necessary to transfer the liquid into the tire;

(2) Because of the increased weight it would be necessary either to use a crane to handle the tire, or to remove and then replace the fluid.

The equipment necessary to install the liquid in the tire includes a gear pump, electric motor on gasoline engine driven, where a time element is to be considered. A special valve that will admit the liquid and at the same time release the displaced air, plus the necessary hose and fittings, is also needed.

As an added thought to this subject it should be noted that tubeless tires are now being furnished with some heavy equipment. Liquid injurious to the metal rim, such as calcium chloride, should not be inserted in these tires.

Prestressed concrete in buildings

To what extent can prestressed concrete be used in railway buildings? What are its advantages? Disadvantages, if any? Explain.

Often very economical

By A. H. Gustaferro
Prestressed Concrete Division
Consumers Company
Chicago

Prestressed concrete can be used efficiently in any building which has many identical bays, especially if the bays are large. Freighthouses, warehouses and many other railway buildings fall in this category. Floors and roofs of prestressed concrete with spans of 25 ft to 50 ft are becoming commonplace, while shorter and longer spans are not only possible, but are often very economical. Besides its low initial cost, prestressed concrete offers advantages of being a high quality, fire resistant, low maintenance building material which can be made architecturally attractive. Many of the manufacturers of this relatively new product believe that prestressed concrete will become a major component of the building materials industry in the near future.

Can be used to advantage

By Engineer Of Buildings

Prestressed concrete can, in my opinion, be used to considerable advantage in railroad building construction and I predict that its use will become wide-spread in the years to come. There are, at present, two forms of prestressed concrete — already proven in design and loading— which could be employed. One form is, of course, the prestressed slab. Such slabs offer strength, reduction in weight and ease of construction for floors and roofs, especially in larger buildings such as warehouses where large surface areas are involved. This by no means, however, precludes its use in smaller structures where proportionate savings could be realized.

The second form of prestressed concrete which could be used to advantage is the prestressed columnar section. These sections, in round, square and other shapes, can be gainfully employed in piling and building column construction and for beams. Constructed in large quantities at the site, prestressed concrete slabs and sections will materially reduce manufacturing costs and at the same time be less susceptible to cracking.

What length of rail is best ?

What are the relative advantages and disadvantages of the three most common lengths of rail used in main line track today: 39-ft; 78-ft; and continuous? Explain.

All have advantages—right now

By E. P. Hackert
Division Engineer
Denver & Rio Grande Western
Denver, Colo.

It would be easy to make the statement: There are few advantages and many disadvantages in 39-ft and 78-ft rails while the reverse is true of continuous welded rail. However, true this may be, we are still in the "fairly early" stages of continuous welded rail development and must necessarily consider the shorter lengths in our planning—for a time at least.

Thirty-nine-foot rails, obviously, have the advantage of being easier to handle and haul, particularly by section crews where required for emergency repairs in track due to mill defects, rail damaged by derailments, flat wheels and the many other conditions which occur. The existence of certain types of rail lubricating devices which require special 39-ft rails is also an item to be considered in relaying rails of lengths greater than 39 ft or 78 ft, unless it is desired to cut in a 39-ft length of rail or change the lubricators.

Another advantage of particular interest to our railroad is the relative ease of transposition of curve-worn rails. Straight transposition of low rail to high side and high rail to low side requires the low rail to be turned gage-to-gage when laying it on the high side of a curve, hence making impractical the use of the simple technique in such operations with longer rails.

On the debit side again, obviously, the cost of joint maintenance is directly proportional to the number of joints per unit distance. Included in this cost should be: Joint lubrication (at least once annually); bolt tightening (follows lubrication by about one week); bonding, welding and slotting of rail ends (depends primarily on condition of roadbed and traffic density); spotting of joints; and the decreased life of joint ties unless

(Continued on page 59)

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joint tie pads are used. In addition to these items, the distribution of 39-ft rails preceding a rail relay, while not double the cost of distributing 78-ft rails, is somewhat more than 50 per cent of the cost.

It is not the intention of the writer to ignore discussion of relative advantages and disadvantages of 78-ft rails, but since our railroad has not used this length in sufficient quantity to qualify information as first hand, the few remarks will be classified as conjecture.

First, it would appear that 78-ft rail would have most, if not all, of the advantages of 39-ft lengths and proportionally fewer disadvantages. Since 78-ft lengths can be handled into track during relays by a single machine, the distribution and laying should be more rapid and economical. The 50 per cent reduction in joints will result in proportional savings in joint maintenance as outlined. The problem of replacing curve-worn rails is made slightly more complex as the low side rail cannot, in most cases, be reversed without the aid of a suitable crane. However, as will be discussed later, 78-ft and longer low-side rails can be moved ahead to the next curve of opposite direction and laid in on the high side thereby virtually "reversing" the rail. This process can be continued as long as the curves to be transposed are reasonably close together.

The disadvantages of 78-ft lengths are somewhat the same as 39-ft rail, and proportionally fewer due to the reduced number of joints and easier handling, but with a few additional disadvantages due to increased length. For instance, this length rail cannot be easily handled by a single section crew. In addition, in the event of defects found by a detector car (since it is our practice to remove *entirely* all rail in which a defect is found), it would be necessary to remove the entire 78-ft length and replace it with another or with two 39-ft lengths. Also, 78-ft lengths could not very well be loaded on the rail car of a wrecking outfit so, in the event of derailment damaged rail, 39-ft lengths would probably have to be used and later replaced or field welded and joint bars reapplied.

The matter of rail anchorage has not been discussed in connection with either 39-ft or 78-ft rails since it would appear the per-panel number of anchors apply to either length in accordance with individual railroad's standards should not change appreciably, if any.

In considering the advantages of continuous welded rail, it should be borne in mind that, while this type of installation is no longer in the strictly experimental stage, fabrication and handling processes are far from the ultimate goal and as techniques are bettered and knowledge of problems is increased, the advantages of this type of installation will be increased many fold and the disadvantages decreased.

Again, the obvious: fewer joints—less maintenance. The elimination of joints certainly provides a better riding, more easily maintained track. The initial cost per gas-welded joint exclusive of amortization and/or rental of equipment very closely approximates that of jointed rail and promises to decrease as techniques and equipment improve. Distribution of long lengths — greater than 750 ft—costs less than the distribution of like amounts of 39-ft or 78-ft length and is readily accomplished using suitable equipment. Handling into track is accomplished easily and rapidly using an on-track crane and "basket" through which the long rails are threaded and guided into pre-gaged tie plates. By properly programing the work on a daily basis, closing up for trains in single-track territory presents no particular problem.

Since there are joint-bars only each ¼ mile or so, joint maintenance during the life of the rail is almost negligible as is frequent replacement of joint ties. Since few rail bonds are required, this cost item is greatly reduced.

As previously discussed, transposition of worn curve rail requires a different technique in that low-side rails are carried ahead to the next curve of opposite direction within reasonable distance and laid in on the high side. While this cannot, in most cases, be accomplished by local crews, when properly programed and performd by a small extra gang using adequate equipment, it should not result in costs higher than are required to transpose short rails.

Some difficulty is being experienced on various roads with pull aparts, particularly at insulated joints. This condition will probably be corrected by development of improved laying and fastening techniques, system of anchorage, and different types of insulated joints, particularly the latter since the same type joint is being used for continuous rail as is being used for jointed rail.

It is not unreasonable to assume that replacement of damaged rails will eventually be accomplished by field welding as new welding techniques are developed and proved adequate for field repairs.

Anchorage problems are becoming less pressing as experience is gained, although several systems are yet being tried as dictated by local conditions of grade, direction and density of traffic, and temperature variations.

It is the opinion of the writer that the disadvantages of continuous rail exist, for the most part, because of inadequate (at present) techniques, equipment, and appurtenances, all of which will undoubtedly improve as research and practical experience continue.

While it is not felt that continuous rail will supplant jointed rail in all instances immediately, it is interesting to speculate on the methods which will be used 10 or 15 years hence.

Continuous rail the answer

By G. M. O'Rourke
Assistant Engineer Maintenance of Way
Illinois Central
Chicago

Please recall the panel discussion on 78-ft rail and continuous-welded rail at the last AREA convention. One panelist opposed both 78-ft and continuous-welded rails. Two panelists favored 78-ft rails over continuous-welded rails, and two panelists were of the continuous-welded rail school to which I am an adherent and which I endorse.

For a century, the existence of rail joints has been considered a necessary evil, requiring expenditure of from 15 to 40 per cent of labor expense in maintenance. In laying 78-ft rails we get rid of half of them but with 1443-ft (37 rails 39 ft long) continuous-welded, or strings of greater lengths by butt-welding them in the field, we can be free of all but

those at insulated joints and at turnouts. There are about 135 joints per rail per mile in 39-ft rail track, about 67 joints when 78-ft rails are used, and only about four per mile with 1443-ft and, possibly, a lesser number if the rail is field-butt-welded into the longest possible length between insulated joints and turnouts.

Long rails—longer than 78 ft—are slightly less expensive to weld, are easier to load at the welding plant, and are easier and less expensive to unload and lay. Labor to lay 39-ft rails costs approximately $1300 per track-mile, about $1700 per 1443-ft rails and $2300 in round numbers, to lay a mile of 78-ft rails.

To successfully handle 78-ft rails one should have a Model 40 Burro crane with a 50-ft boom and spreader bar in place of the Model 30 Burro cranes most railroads now own.

To transport 78-ft rails, 65-ft drop-end mill type cars are required and they are scarce. In addition, spacer cars must be provided for the rail over-hang at each end of the mill type car. This and the necessity of rearranging handling and cooling-box and other facilities at rolling mills are the reasons why rail manufacturers refuse to make 78-ft rails at this time.

Some figures we have show a labor saving in joint maintenance of from $300 to $400 per mile for 78-ft rails over 39-ft rails, and a saving of $650 per mile for 1443-ft strings over 39-ft rails.

Railroads of the United States installed more miles of continuous-welded rail and had more miles of welded rail in service in 1956 than ever before. Figures of the AAR Engineering Division show 169.9 miles installed in 1955, bringing to 602.1 the total of such mileages. The cost of installing this continuous-welded rail exceeds that for conventional bolted rail but is less than for 78-ft rails. The added cost is more than offset by savings in annual maintenance costs, in the extended service life of welded rail, in longer cycles for out-of-face surfacing, salvage value of joint bars and bolts, cost of tightening bolts, cleaning and oiling joints, renewing bond wires and building up and cross-grinding rail ends and tamping joint ties.

There are places for 78-ft rails in preference to continuing the use of 39-ft rails. They should be laid on curves in continuous-welded rail territory, and in street and road crossings everywhere but not out-of-face for long distances anywhere, in my opinion.

Reduction of bridge design loading

In the light of the complete dieselization of many roads, it has been suggested that a reduction be made in the design loading of bridges from E72 to E60 or E50. What savings can be realized from such reduction? How much reduction can be safely made? Explain.

Design E65 to E72

By E. W. PRENTISS
Engineer—Bridges & Buildings
Pennsylvania
Philadelphia, Pa.

The rating of our present diesel and electric power varies from about E35 to E60. We also have considerable steam power in service rating up to E77.

Certain special cars and equipment are particularly severe on short span bridges and floor systems. These cars and their ratings are as follows:

Special heavy shipments	up to E90
Wreck derricks	up to E75
Train of gondola cars	up to E55
Hot metal cars	up to E134

On long truss spans, certain short wheelbase ore cars rate in excess of E75.

In view of the above loadings, it is our opinion that for bridges on main line, floor systems and shortspan bridges should be designed for E72.

As regards the savings that may be realized by designing for E50 instead of E72, a recent study indicates that the savings are less than 3 per cent.

Retain E72 loading

By C. E. EKBERG
Bridge Engineer
Northern Pacific
St. Paul, Minn.

The widespread use of diesel power with its "E" rating lower than the heavier steam locomotive naturally brings up the question whether the future design loading of bridges should be reduced from E72.

The present trend is toward more and more mechanization which has led to bigger and heavier cranes and pile drivers. Our new diesel electric cranes equipped with folding leads and diesel pile hammers have heavy axle loads but rate above E-65 for spans under 30 ft. Our 250-ton wreckers have lighter axle loads but rate above E-60 for spans under 30 ft.

Many western railroads have been requested to handle full train loads of 70 ton ore cars which for spans in excess of 75 ft rate in excess of E-65. Occasionally there are heavy loads, such as transformers, which also exceed E-65 for moderate span lengths.

Bridge design specifications do not provide for increase in size of members due to effects of corrosion or collision. By increasing the E rating slightly, the above factors contribute to the safety of the structures. There are times during business recession when maintenance is deferred which leads to corrosion. Occasionally a load will break loose while passing over a bridge which results in damaging some members; consequently, if there is some extra strength in the structure the bridge will still be able to function until repairs are made. This might not be possible if a bridge were designed to the rating of present diesel power.

The economic study of reducing design loading from E-72 to E-50 appears in report of Committee 15 on Assignment 11 in the 1956 Proceedings of the AREA. This study showed that the increased cost for a complete bridge was about 3 per cent if E-72 loading were used instead of E-50. That report also mentioned that future diesel engines may have progressively heavier axle loadings to

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increase traction similar to the history of steam engines.

The small additional cost for retaining E-72 loading in bridge specifications is economically justified.

Savings hardly justifies

By E. S. BIRKENWALD
Engineer of Bridges
Southern
Cincinnati, Ohio

It has been established by AREA Committee 15 that the maximum savings which can be realized in reducing the design loading from E72 to E50, is 3 per cent of the total cost of the bridge; while the maximum saving for a reduction in the design loading from E72 to E60, is about 1½ per cent of the total cost of the bridge. In other words, the savings involved hardly justify a reduction in the capacity of a bridge to carry load, when all factors are considered.

The extra metal purchased in a E72 design as against an E50 or E60 design, provides for a reduction of stress in the bridge, thus affording relief to future maintenance of members or parts of members where reversal of stress or a greater range of stress occurs. The extra metal will provide extra thickness of material to resist corrosion, either atmospheric or from brine drippings, thus affording relief to yet another form of future maintenance. With the reduction of maintenance forces for repair of bridges either imminent or already in effect, it should be obvious that a reduction in the design capacity will lead to more maintenance earlier in the life of a bridge and that the element of maintenance must be considered when determining the design.

In order that there may be no confusion by the fact that many bridges are still being used which are of E40 or E45 design, it must be remembered that these same bridges do have a greater carrying capacity because of specification changes in impact and allowable unit working stresses. When the E40 or E45 bridges were built, the basic unit stresses were of the order of 16,000 psi, which in modern design have been increased to 18,000 psi—notwithstanding the fact that the yield point of the steel, although specified in the early 1900's at 30,000 psi, rarely fell below 33,000 psi, which is now specified. Impact for diesel locomotives is less than for steam engines because there is no dynamic augment; consequently, additional capacity has been gained by the older bridges of the E40 or E45 design, where dieselization has been accomplished.

While diesel locomotives today produce the equivalent of E40 to E56 loading, it is evident that the designs of future diesel locomotives may increase in loading in order to meet the requirements of railroads. In other words, the development of diesel locomotives is following the same pattern as the development of the steam locomotive. Within the next ten years, it is likely that diesel locomotives may rate as high as Cooper E65 loading.

Since 1945, a trend has developed in which certain kinds of rolling stock now produce greater stress in bridges than diesel locomotives and this development has not abated. Ore, transformer and flat cars are being built with more carrying capacity, which results in heavier axle loads and greater loads on bridges. Depending upon the span length of the bridge, these cars will produce the equivalent of E60 to E82.

Taking into account the many factors involved in the determination of a design loading for a bridge, it is felt that any reduction below E60 loading is unwise, that a reduction to E65, except for main lines, can be safely made, and that it is preferable to design new bridges for E72 loading, not only for main lines, but for those branch lines where freight traffic justifies such design.

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Sterilizing new water systems

What methods are most efficient for sterilizing piping, fittings and other component parts of newly installed drinking water systems before they are put to use? What precautions must be taken? Explain.

Several factors involved

By R. C. ARCHAMBEAULT
Sanitation Engineer
Southern Pacific
San Francisco, Cal.

Sanitary and hygienic practices by municipal, private and organizational utilities indicate that a number of "efficient" sterilization methods ostensibly have been established and are being used to disinfect piping, fittings and other appurtenances of newly installed potable water supply systems.

Efficacies claimed for these practices by their advocates may be debatable or sometimes questioned in the hands of other operators because of complex contamination possibilities attending such new installations. Among these are the pollution potential always surrounding layout and installation, inconsistency of protective sanitation measures observed in progressing work, clean personal

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work habits and pollution preventive skill exercised by water service crews making installation, character of supervision and other factors—all of which directly bear upon the final sterilization efficiency of any method employed.

The absolute amount of sterilization required is a function of the degree of contamination introduced into any new system during its installation, as measured by bacteriological determinations on representative water samples taken from the thoroughly flushed system and analyzed according to well-known drinking water standards.

Dependent upon the character of the potable water source used and the cleanliness sealed inside a newly closed installation, a new system may require nothing more than efficient flushing for safe service. Or, efficient sterilization may involve chlorination with 200-500 ppm free available chlorine, or more, over a 24-hr retention period, followed by adequate flushing with potable water and water quality checks before safely permitting use of the facility. Efficient sterilization of any new system is a relative expression, heavily qualified by the above factors.

The most efficient sterilization procedure for any new system is one which will safely disinfect the entire installation within a minimum treatment time, after which the system will indefinitely self sustain and deliver a quality water meeting the public health standards. Every new installation must be appraised on its own merits.

From a health standpoint each new installation should be regarded suspiciously, isolated pending effective sterilization, and proven by water quality examinations before placing into service.

Provided the above precautions covering preventive sanitary measures are seriously observed by all concerned in constructing a new potable water system, the following sterilization method will usually afford an efficient, safe disinfection of facility, viz:

(1) Load system with potable water and make necessary pressure tests.

(2) Drain and flush system as thoroughly as possible with available water pressure through existing outlets.

(3) Add liquid laundry bleach (21 per cent) to beginning of facility and build up dosage throughout system to a minimum of 200 ppm free available chlorine. Bleed all extremities to draw disinfectant through.

(4) Retain disinfectant in system for 24 hr, during which period a minimum concentration of 60 ppm free available chlorine should be maintained.

(5) Flush treated system thoroughly with potable water.

(6) Check quality of water from several representative points on system for satisfactory compliance with the latest drinking water standards. At least two repeated analyses should be made after system shows clear.

(7) When all samples taken prove satisfactory and system is approved by local health authorities having jurisdiction, cut new facility into service.

Uniform dosage important

By T. L. HENDRIX
Sanitary Engineer
Chesapeake & Ohio
Richmond, Va.

The sterilization of newly installed drinking water lines and appurtenances is almost invariably done with chlorine or chlorine producing compounds, wit a choice of exact technique dependent on the individual characteristics of the installation. The principal requirement is the application of a fairly uniform dosage of 50-ppm chlorine throughout the system for about 12 hr, followed by thorough flushing out of the highly chlorinated water.

However, it is considered that care in excluding contaminating materials from the interior of the pipe during construction, deletion of "difficult to sterilize" pipe jointing materials such as jute packing and thorough flushing of the finished line at velocities not less than 2.5 fps prior to sterilization, are fully as important as the sterilization itself.

There have been cases noted where excessive concentrations of chlorine have damaged the inside coating of cast iron pipe line and caused red water complaints because of corrosion, but this is unlikely if reasonable care is exercised.

Chlorine gas injected directly into water in the line has been used for sterilization, but is considered hazardous and difficult to proportion.

Application of appropriate amounts of dry hypochlorite powder into each length of pipe during laying, followed by careful filling of the line with water is a common method but this procedure precludes flushing of the line prior to sterilization.

For large systems it is considered best to pump in hypochlorite solution at the proper rate to give the required 50-ppm dosage while water is being wasted at extremities of the system. When chlorine shows up at the far end, allow it to stand 12 hr and then flush lines. The presence of the highly chlorinated water is easily detected by odor or by a deep orange color when tested with orthotolidine solution.

For smaller systems, slow dissolving hypochlorite tablets (Mathieson HTH tablets) may be secured to the top inside surface of the pipe during construction at intervals determined by pipe size. These tablets weigh about one-sixth ounce and contain 70 per cent available chlorine, so each tablet is capable of producing a 50-ppm concentration of chlorine in about 20 gal of water. The tablets may be attached to top of the pipe by pitch, Permatex, or other appropriate cementing material.

Need uniform dispersal

By E. R. SCHLAF
Assistant Superintendent Water Service
Illinois Central
Chicago

Proper disinfection of water systems requires that the disinfectant used, generally chlorine in one of its forms, be uniformly dispersed throughout the system, and that it reach all surfaces in sufficient concentration and for a period long enough to destroy all bacteria. The contact period depends upon the dosage and the distribution of polluted material to be penetrated. For thoroughly flushed surfaces, a contact period of 4 to 24 hr is usually recommended for a dosage of 50 ppm of chlorine. The contact period may be reduced to 1 hr by increasing the chlorine dosage to 100 to 200 ppm.

Methods of introducing chlorine into water systems are:

(a) Injection of hypochlorite solution with a force pump or hypochlorinator;

(b) Injection of chlorine solution with a gas chlorinator;

(c) Injection of chlorine gas direct from a cylinder;

(d) Placement of hypochlorite powder or paste in the main.

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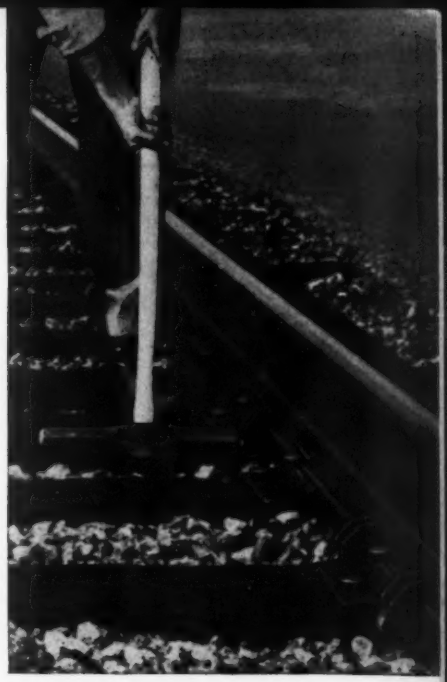

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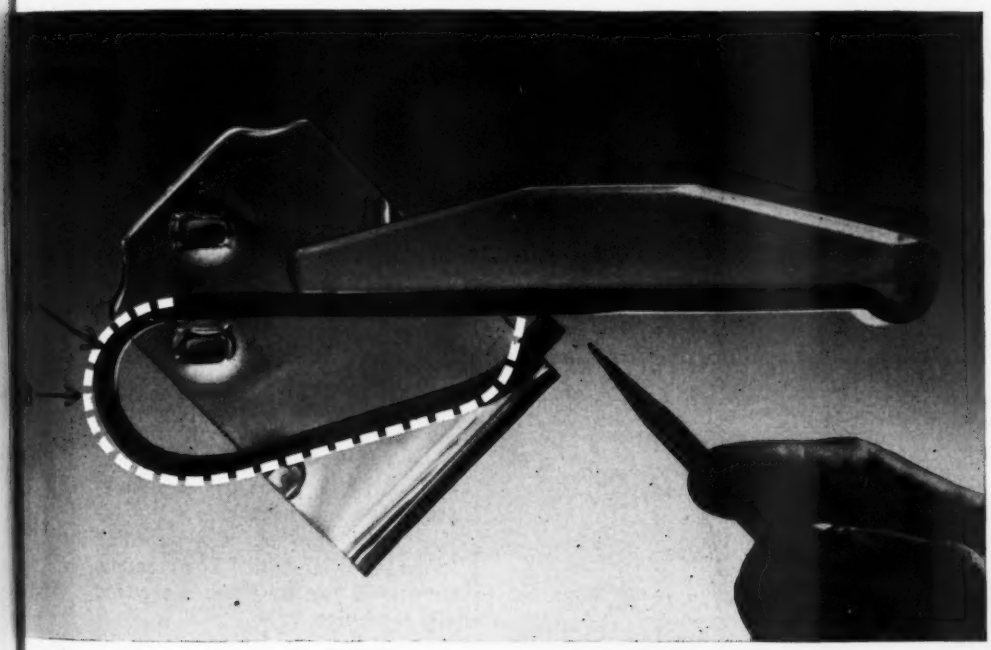

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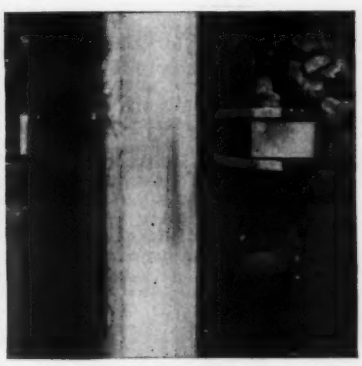

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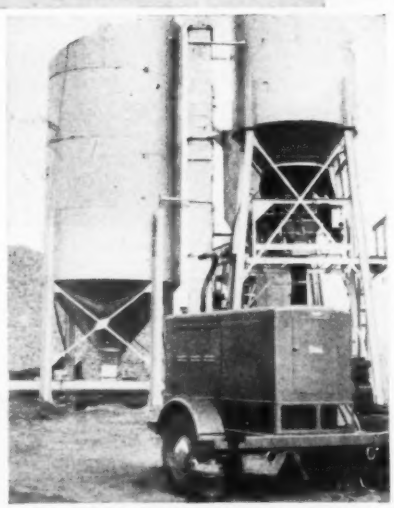

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What's the answer? (cont'd)

A 1 per cent hypochlorite solution (10,000 ppm) may be prepared by stirring 1¼ lb of 70 per cent chlorine compound or 3½ lb of 25 per cent chlorine compound in 10 gal of water. This solution can be used to treat 100 ft of pipe with a 50-ppm chlorine dosage according to the following table:

Pipe size in inches	One per cent Chlorine solution required
2	2/3 pint
4	2½ pints
6	3 quarts
8	5 quarts
10	2 gal
12	3 gal

The chlorine solution should be uniformly distributed throughout the system, not "slugged" into the main and then followed by water. A chlorine residual after the four-hour contact time should be at least 5 ppm; if it is not, the process must be repeated.

The most satisfactory method of applying chlorine to a water main is injection of a solution of water and chlorine by means of a gas chlorinator. The procedure for disinfecting mains by this method is similar to that outlined for hypochlorite solution feed.

The disinfection of mains by means of hypochlorite powder or paste is not recommended because of irregularity of concentration. However, if no other facilities are available, mains may be closed according to the following table. The amounts shown will give a 50-ppm dosage for 100 ft of pipe.

Pipe size	Ounces of 70 per cent Hypochlorite powder	Ounces of 25 per cent Hypochlorite powder
2	0.2	0.5
4	1.0	2.0
6	2.0	4.0
8	3.0	7.0
10	4.0	11.0
12	6.0	16.0

If chlorinators are not available, gaseous chlorine may be injected directly into the main from a chlorine cylinder. A disadvantage of this method is in the control of the rate of feed and obtaining good diffusion. Great care must be used to prevent entrance of water into the cylinder as a result of pressure changes in the main and cylinder. Pressure in the main should

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not exceed 25 psi and the rate of discharge should not exceed 40 lb in 24 hr.

To disinfect water storage tanks properly, it is necessary to scrub the inside surface to remove organic matter which may prevent the disinfectant from reaching the surface to be treated. Chlorine may be added by direct application of a strong solution to the surface, chlorination of the water as it enters the tank, or direct application to the filled tank. Below are given dosages for various sizes of tanks to secure 50-ppm chlorine.

Capacity in gal	Lb of 70 per cent Hypochlorite powder	Lb of 25 per cent Hypochlorite powder
1,000	0.6	1.7
5,000	3.0	8.3
10,000	6.0	16.7
20,000	12.0	33.3
40,000	24.0	66.7
60,000	36.0	100.0
80,000	48.0	133.0
100,000	60.0	167.0

The contact time is the same for tanks as it is for pipe lines.

After the tank is sterilized the facilities should be drained and flushed until a maximum residual chlorine reading of 1.0 ppm is obtained. Simple but effective chlorine comparators are on the market and they are necessary in the testing operation. They are sold in different ranges, and the two recommended are 0.0-1.0 ppm and 0.0 to 50.0 ppm.

Keep process simple

By H. M. Schudlich
Engineer of Water Service
Northern Pacific
St. Paul, Minn.

If the procedure for sterilizing newly installed drinking water systems is not kept simple, chances are that the sterilization procedure will be omitted in actual practice. Therefore, the simple method of placing dry calcium hypochlorite powder or tablets in each pipe joint or fitting is recommended.

Although some sources have criticized this method because the main cannot be flushed prior to sterilization and because it is practically impossible to prevent washing most of the disinfectant to the far end of the system, the convenience of handling and the results obtained by the method have outweighed its shortcomings especially for use in short main extensions or small pipe work.

Most maintenance men prefer to use the tablet form of the high test calcium hypochlorite because the tablets are easier to handle and may be fastened inside the pipe by hot tar or a gasket cement such as Permatex No. 2. Normally a minimum chlorine dosage of 30-50 ppm may easily be obtained by the use of one tablet in approximately 20 ft of small piping up to 4 in. in size.

Tablets fastened inside the pipe will dissolve slowly over a period of time and the density currents generated by the solution of the chemical will carry the hypochlorite solution for quite some distance.

It is recommended that the new system be filled with water slowly and allowed to stand for 24 hr if possible before being flushed. In fastening the tablet to the pipe, it is necessary to apply the cement to one side of the tablet only, taking care not to cover the edges or the exposed face of the tablet so that nothing will interfere with its dissolution.

For use in piping smaller than 1 in, it is usually necessary to break the tablet into smaller pieces or use the dry calcium hypochlorite powder. A half teaspoonful of the dry high-test calcium hypochlorite powder approximates the dosage of a single tablet.

For the average presusre tank system the use of commercial bleach solution (sodium hypochlorite) is most convenient. These are obtainable at all grocery stores and they contain approximately 5 per cent hypochlorite. One ounce added to 8 gal of water or 1 gal to 1,000 gal of water will result in a solution containing 50 ppm of available chlorine. The entire system should be filled with this strength of chlorine solution, allowed to stand for several hours, then thoroughly flushed to remove the last traces of chlorine.

If it is deemed necessary, bacteriological samples should be taken in the usual manner and, if contaminations persist, the entire system should be retreated as before with chlorine solution.

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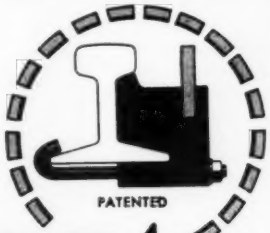

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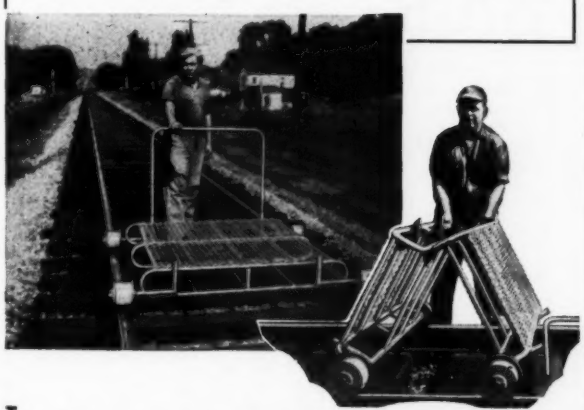

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News about people

(Continued from page 24)

president, was elected also chief executive officer at a meeting of the board of directors on April 23. Mr. Ruppert began his service in 1922 as a service engineer with the P. & M. Co., now a division of Poor & Company, after a short career in the engineering department on the Rock Island. He subsequently served as a salesman, district sales manager, vice-president of sales, and president, assuming the latter position in 1943. He was elected vice-president of Poor & Company in 1949, first vice-president in 1951, and president in 1956.

RAIL JOINT COMPANY — Philip J. Kirst has been appointed sales representative, effective June 1, with headquarters at the Chicago offices of this division of Poor & Co.

SIMMONS-BOARDMAN PUBLISHING CORP. — Duane C. Salisbury has joined the company, publishers of *RT&S* and Railway Age, at New York as vice-president and director of sales for its railway division. A graduate of the University of Michigan, Mr. Salisbury has been vice-president and general sales manager, Detroit Colortype Co., and president of the Carter Co., Detroit, Mich. From 1943 to 1948 he headed advertising sales for the transportation group of McGraw-Hill magazines.

TRUE TEMPER CORPORATION — Robert J. Whalen, division sales manager at Chicago, has been appointed sales manager of the firm's rail appliances division, succeeding Frank J. Reagan, who has retired. Mr. Whalen will maintain his headquarters at Cleveland, Ohio.

Duane C. Salisbury
Simmons-Boardman

Robert J. Whalen
True Temper

Biographical briefs

Robert E. Trickey, 52, who was recently named superintendent bridges and buildings on the Bangor & Aroostook (*RT&S*, March, p. 100), graduated from Gorham State Teachers College and, prior to joining the B&A in June 1934, worked in various high school teaching capacities and as a high school principal.

William S. Ray, 54, who was recently promoted to engineer of bridges and buildings of the Central of Georgia at Savannah, Ga. (*RT&S*, April, p. 66), graduated from Clemson A&M College and joined the CofGa in January 1925 as inspector of bridges and buildings. He served subsequently as assistant engineer B&B., architect and engineer of bridges until August 1, 1955, when he was named general superintendent of bridges and buildings—the position he held when he received his most recent promotion.

Robert E. Trickey
B&A

William S. Ray
CofGa

John M. Patterson, 40, who was recently promoted to roadmaster on the Canadian Pacific at Prince Albert, Sask. (*RT&S*, March, p. 98), graduated from the University of Saskatchewan and joined the CPR in April 1953 as a transitman. He served in this capacity at Penticton, B. C., Vancouver, and Regina, Sask., prior to his recent promotion.

John N. Barnes, Jr., 47, who was recently named roadmaster on the Denver

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Biographical briefs (cont'd)

& Rio Grande Western at Kremmling, Colo. (*RT&S*, March, p. 98), joined the D&RGW in 1923 as a section laborer. He served as carman apprentice, car repairman, and later as roadmaster on the Denver & Salt Lake. He was serving as track supervisor on the D&RGW at the time of his recent promotion.

Leonard E. Bates, 53, who was recently named chief engineer of the Atlantic Coast Line at Wilmington, N. C. (*RT&S*, April, p. 66), graduated from Georgia Institute of Technology and joined the ACL in 1925 as a rodman at Waycross, Ga. He served successively as instrumentman, assistant engineer, chief clerk to auditor of construction, junior engineer, senior assistant engineer, division engineer and roadmaster until April 1, 1947, when he was promoted to engineer maintenance of way at Jacksonville, Fla. In July 1951 he was named assistant to chief engineer at Wilmington and on September 16, 1956, was promoted to assistant chief enigneer.

Robert L. Groover, 65, who was recently named assistant general manager of the Atlantic Coast Line and Charleston & Western Carolina at Wilmington, N. C. (*RT&S*, April, p. 66), graduated from Alabama Polytechnic Institute and joined the ACL in 1914 as an inspector and draftsman. After working eight months as a draftsman with the Central of Georgia, he returned to the ACL in November 1916 as a draftsman, computer and pilot engineer in the valuation department. He subsequently served as assistant engineer, office engineer, engineer of design and principal assistant engineer. In May 1943 he was named associate director, way and structures, Office of Defense Transportation and, upon his return to the ACL in November 1944, was promoted to assistant chief engineer. He was named chief engineer of the ACL and subsidiary lines in March 1947.

H. B. Christianson, 64, who recently retired as special engineer of the Chicago, Milwaukee, St. Paul & Pacific at Chicago (*RT&S*, April, p. 66), graduated from the University of Minnesota and joined the Northern Pacific in 1915. He worked in the valuation department of the Soo Line in 1916 and in 1917 joined the Milwaukee where he served continuously, except for army service in both world wars, as field draftsman, instrumentman, assistant engineer, division engineer and assistant to chief engineer. He was named principal assistant engineer, system, on June 1, 1947, and in 1950 was appointed assistant chief engineer, system. He was named special engineer on September 16, 1953.

Robert L. Williams, 38, who was recently named assistant engineer in the office of the chief engineer of the Illinois Central at Chicago (*RT&S*, April, p. 66), graduated from the University of Illinois and joined the IC in June 1941 as a chairman. He subsequently served as rodman, and assistant supervisor and, in October, 1946, was named supervisor of track at Freeport, Ill. He was transferred to East St. Louis in February 1952—the position he was holding when he received his recent promotion.

Leonard E. Bates
ACL

Robert L. Groover
ACL

Association News

Railway Tie Association

A change has been made in the dates of this association's 1957 convention, which will be held at the Jung Hotel, New Orleans, La. The convention will be held on October 16-18 instead of November 6-8 as previously announced.

Metropolitan Maintenance of Way Club

The annual meeting of the club was held on April 25 at the Railroad Machinery club, New York. The main feature of the program was a panel discussion on the subject "Welded Rail vs. Conventional Rail" (reported elsewhere in this issue). The following new officers were elected:

President — W. W. Chaffee, general track supervisor, New Haven; first vice-president—E. C. Lawson, division engineer, Reading; and second vice president —W. D. Almy, engineer maintenance of way, Central of New Jersey. Gordon Rogers, *Railway Track & Structures*, was re-elected secretary-treasurer.

Northwest Maintenance of Way Club

In the election of officers, held at the annual meeting on April 25, W. J. Cruse, engineer maintenance of way, Great Northern, and first vice-president of the club, was advanced to president; C. J. Freseman, division engineer, Chicago, St. Paul, Minneapolis & Omaha, and second vice-president, was elevated to first vice-president; and S. H. Barlow, system engineer of track, Northern Pacific, and a member of the Executive Committee, was elected second vice-president.

George G. Prest, George G. Prest Company, was elected executive secretary, and Leo C. Blanchard, roadmaster, Milwaukee Road, was re-elected secretary-treasurer.

Members of the Executive Committee, to serve two-year terms, were elected as follows: R. W. Gustafson, bridge engineer, Great Northern; C. V. Schutt, assistant district engineer, Northern Pacific; and M. A. Nelson, chief engineer, Minneapolis, Northfield & Southern.

Maintenance of Way Club of Chicago

In the election of officers, which occured on April 29 at the annual meeting held at the Hamilton Hotel, Chicago, F. J. Corporan, superintendent, ways and structures, Chicago, South Shore & South Bend, was advanced from first vice-president to president; B. O. Johnson, office engineer, Milwaukee Road, was moved up from second vice-president to first vice-president; and W. A. Buckmaster, assistant division engineer, Baltimore & Ohio Chicago Terminal, and a director of the club, was elected second vice-president. S. F. Kosco, chief clerk to division engineer, Illinois Central, was re-elected secretary-treasurer; and M. H. Dick, editor, *Railway Track & Structures*, was re-elected executive secretary.

New directors elected include D. J. Hogan, Donald J. Hogan & Co., E. F. Snyder, assistant to chief engineer, Illinois Central; and S. E. Tracy, superintendent work equipment, Chicago, Burlington & Quincy.

BACK-OF-THE-BOOK *Briefs*

Corrosion inhibitor for rails tested in tunnel

Interesting results are reported from a service test, made in a tunnel in England, to determine the effectiveness of a coating applied to the rails as a means of preventing corrosion. The coating is known as Dampcoat and is offered in this country by the Xzit Chemical Company, Hoboken, N. J.

A test section of the track comprising a number of treated and untreated rails was laid in March 1955. The treated rails were coated with Dampcoat which was brushed over the entire surface excepting the crown.

The rails under test were mechanically cleaned and inspected at the end of eight months and again after an additional period of approximately 11 months. The cleaning was done with heavy metal chipping rods with flattened and sharpened ends. It is reported that the uncoated rails required extensive chipping while the removal of the Dampcoat film on the treated rails was quickly and simply achieved.

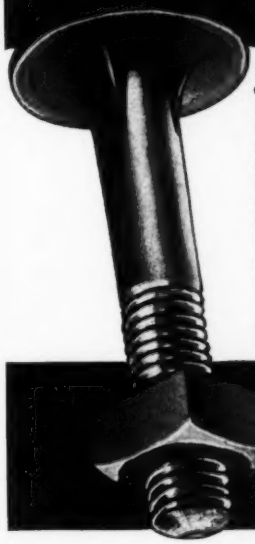
After cleaning, the rails were removed from the track and weighed. The test results showed that the untreated rails, which had an average original weight of 1,947.7 lb, were reduced in weight by corrosive attack and crown wear to an average weight of 1,838.6 lb, thus showing an average loss of 109.1 lb per rail. The loss was 2.57 lb per yd over the first eight months and 2.92 lb per yd over the ensuing 11 months.

On the other hand, the Dampcoat-treated rails, which originally weighed an average of 1,947.8 lb, were reduced in weight by corrosive attack and crown wear to an average weight of 1,890.2 lb.

MOISTURE-PROOF SEAL WITH

Lewis sealtite

LARGE HEAD CAR BOLTS



Large head Lewis bolts are scientifically designed for tank car running boards—new construction or repair. Bevel under head forms waterproof seal reducing wood rot. Head pulls flush, prevents tripping. Shank and head are forged from one piece of steel for greater strength and true thickness—no need for counter boring. In Galvanized for long time economy or Black for low original cost. All are manufactured in the USA to ASTM specifications.

Ask us how you can save money on Sealtite products.

Section of head showing patented fin design which insures maximum holding power with minimum damage to wood — reduces decay and rust. Available with Lock Tight No. 2 or Std. Sq. nuts.

Lewis BOLT & NUT COMPANY

504 Malcolm Ave. S.E.

MINNEAPOLIS, MINNESOTA

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The design and rugged construction of The Q and C One-Piece Guard Rail assure strength, safety, durability and economy. They are easy to install and a minimum of maintenance is required, resulting in reduced costs.

Q and C Guard Rails are well braced to resist thrusts of the heaviest equipment. Specify them on your requisitions.

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Our 71st year in the development of worthwhile track appliances.

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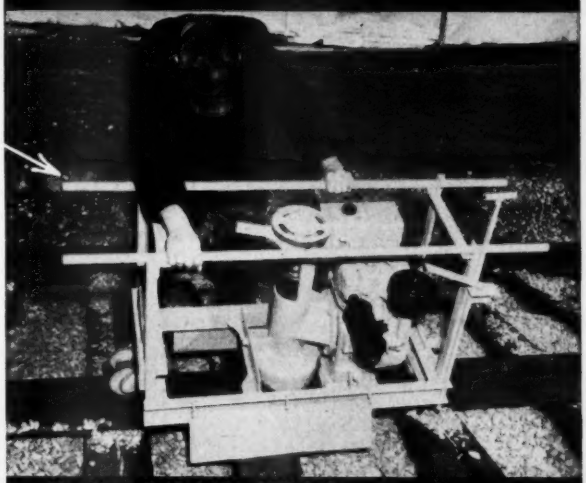

The New SURF-RAIL® GRINDER . . .

A sturdy, lightweight, one man machine for the fast surface grinding of rail . . . used for grinding rail ends built up by welding, removing mill tolerance, leveling cropped rail, grinding welded wheel burns and removing humps at hardened rail ends. Has built-in straight edge—automatic accuracy.

The New BANTAM RAIL SLOTTER . . .*

This simple, easily operated one man machine has been specially designed for cross grinding of rails to remove flow to prevent chipping. Completely portable, machine has rubber tired wheel for moving between rail joints, and is easy to get on and off the track.

*(Patent applied for)

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Back-of-the-book briefs

This was an average loss of 57.5 lb per rail. The loss for the treated rail was 0.507 lb per yd for the first eight months, and 2.46 lb per yd over the ensuing 11 months.

It is pointed out that the Dampcoat, if not removed for inspection purposes as required by the tests, would doubtless have continued to afford protection.

Safety talks for supervisors

The National Safety Council is offering a new booklet of "Five Minute Safety Talks" for railroad supervisors and foreman.

There are 52 talks in the booklet, divided equally between transportation and maintenance of way. The material was written by Daniel P. Russell of the Canadian Pacific, and was reviewed by other experts in railroad safety. The volume is patterned after previous booklets of five-minute talks, but it is the first one to be keyed exclusively to railroad safety.

A foreword points out that, since each railroad in the United States and Canada has its own safety rules, there will be variations from one railroad to another regarding many principals of safe work practice. "Accordingly," it adds, "this book of safety talks strives to present principles that will be generally acceptable on all roads."

The material is informally written so as to be easy to understand, and each chapter is preceded by a cartoon-type illustration designed to point up the particular subject.

Each of the 26 talks on maintenance-of-way safety deals with an operation or a subject involving a hazard of injury. Some of the subjects dealt with include: Power-operated tools, handling ties and rails by hand, handling rail and similar material on push cars, lineups, riding track motor cars, and track jacks. Instructions are included on how to use the material.

Further information and prices may be obtained from the National Safety Council, 425 N. Michigan avenue, Chicago 11, Ill.

. . . About Supply Companies

The Union Carbide & Carbon Corp. has shortened its name to **Union Carbide Corporation,** effective May 1. The name of **Linde Air Products Company,** a division of Union Carbide, has been changed to **Linde Company.**

Moore & Steele Corporation has announced the appointment of **Southeastern Railway Supply, Inc.,** in the persons of **W. Conroy Wilson** and **J. B. Akers,** at 2304 Wilson blvd., Arlington 1, Va., as its railroad representative in the southeastern area.

The **Union Switch & Signal Division** of **Westinghouse Air Brake Company** has discontinued its St. Louis district office. All activities of that office have been transferred to the firm's Chicago office. The move, designed to provide better service to midwest customers was made ". . . after a long and careful study indicated that a more comprehensive program of service and information could be provided by combining the activities of both offices," according to C. W. Hendricks, general sales manager. All correspondence and inquiries should henceforth be addressed to M. R. Waller, district manager, 80 E. Jackson blvd., Chicago 4.

TO THE EDITOR . . .

Readers are urged to avail themselvs of the opportunity to express themselves concerning the contents of this magazine.

Tells about device for Extracting packing bolts

TO THE EDITOR:

Compiling and publishing a periodical such as yours must be much like writing to a friend who seldom if ever answers. Anyway, please accept my compliments on publishing an interesting and informative magazine which I read regularly.

I was very much interested in the article on page 70 of your March 1957 issue entitled "Are the Bridge Forces Lagging?" You mentioned, as one of the machines needed, a ". . . hydraulic device, or one powered by other means, for extracting bolts, drift bolts and chord (packing) bolts in timber bridges . . ."

For years I have tried to figure out some means of removing what we call packing bolts, through power. I have seen two men struggle for two hours to remove one bolt. In many instances it has been necessary to break the cast-iron separator washers and then hacksaw the bolts. This is about the slowest, most expensive operation there is in removing an old trestle. It is true that sometimes the bolts come out without trouble. Usually, though, if they have been in place for 20 to 30 years, they are rusted in place and exceedingly difficult to remove. On our railroad the use of a burning torch is forbidden on timber trestles because of the fire hazard.

Finally with the help and cooperation of Machine Shop Foreman Verlaine Dickman and through trial and error we worked out a fairly crude and awkward device that did the work. Through experience we worked the bugs out of the thing until it works like a charm. The beautiful part of it is that the men using the device have also employed it of their own volition, for other pulling jobs. We have found that there is just no end to the adaptions. The versatility of the tool is limited only by the imagination of the supervisor in charge of the work.

Because the thing worked so beautifully we demonstrated it to some B&B supervisors from a neighboring road. After seeing it in action they wanted one right away for their railroad and encouraged us to present it to an equipment company for exploitation. That we have done and before many more moons the device you asked for will probably be on the market at not too high a price.

LEON M. LARSON
Assistant Master Carpenter
Great Northern
Superior, Wis.

Helps from manufacturers

The following compilation of literature —including pamphlets and data sheets —is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

TRACTOR SHOVEL. Operating and performance advantages provided by the manufacturer's HD-16G and HD-21G tractor shovels are told through pictures and text in a new 8-page, two-color catalog, designated MS-1102. Also included are engineering designs and construction features of the two models which are said to provide the capacity, cost-cutting and versatility that users want in such equipment. (Write: *Allis-Chalmers Manufacturing Co., Tractor Group, Dept. RTS, Milwaukee, Wis.*)

ROAD MACHINERY. A 32-page bulletin is being offered describing the manufacturer's complete line of road machinery. The bulletin, designated HWC 541, describes in detail the firm's motor graders, tandem rollers, and the maintainer. Each of the individual sections of the bulletin describes the advantages of the machines and present their specifications. (Write: *Huber-Warco Company, Dept. RTS, Marion, Ohio*)

CASTING FORMS. A 16-page booklet, designated Bulletin 200, has recently been issued by the manufacturer describing multi-purpose, semi-portable, standardized and interchangeable steel forms for the precasting of reinforced and prestressed concrete. Full specifications and dimensions are included in the bulletin along with photographs illustrating methods of application. (Write: *Food Machinery Chemical Corp., Dept. RTS, Lakeland, Fla.*)

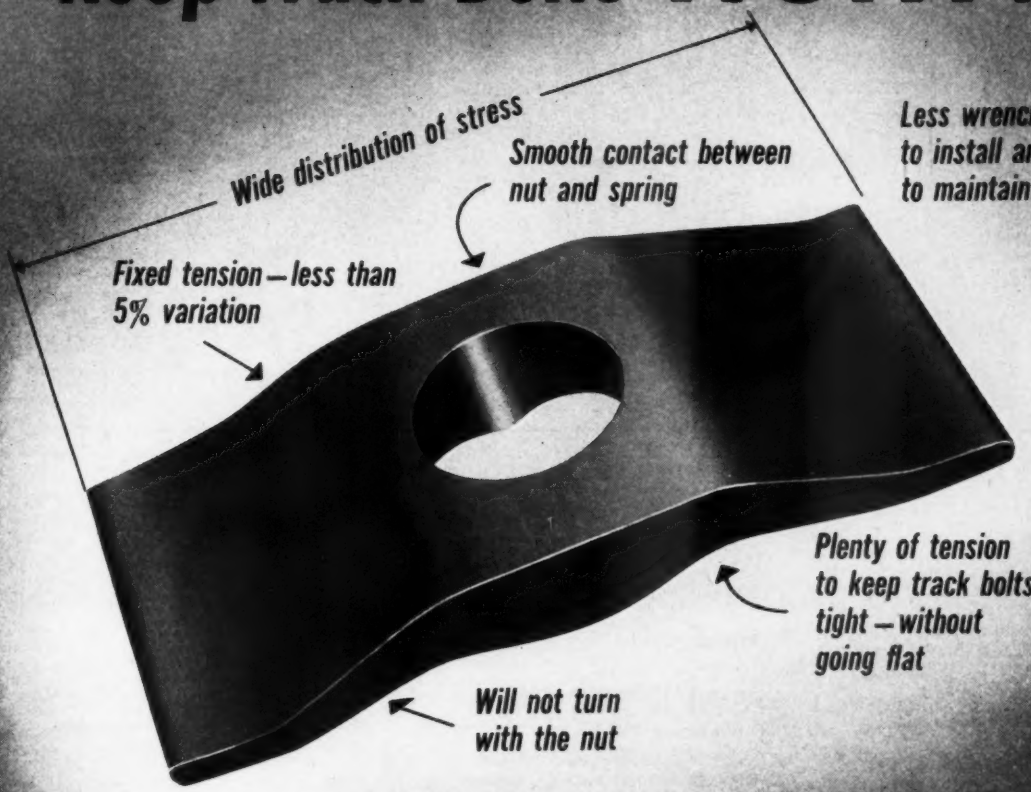
EARTH MOVING. A dramatic, 68-page booklet has recently been issued by the manufacturer to present the ramifications of the construction industry to the average citizen. Entitled "Power in Action," the booklet is amply illustrated with photographs, many of them in full color. Separate sections of the booklet are devoted to mining, road construction, logging, oil and pipe line construction, railroad work, etc. Many forms of track type and rubber-tired equipment are shown and some insight is given into their development—past, present and future. (Write: *International Harvester Company, Dept. RTS, 180 N. Michigan Avenue, Chicago 1.*)

VERONA

FIXED TENSION TRIFLEX

SPRING WASHERS

Keep Track Bolts TIGHT!


Wide distribution of stress
Smooth contact between nut and spring
Less wrenching to install and to maintain
Fixed tension—less than 5% variation
Plenty of tension to keep track bolts tight—without going flat
Will not turn with the nut

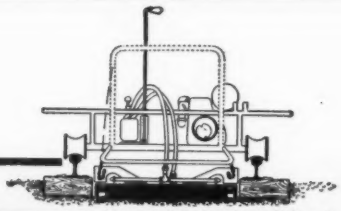
UNIFORM BOLT TENSION
prevents track buckling and pull-apart

HIGHEST REACTION OF ANY SPRING WASHER

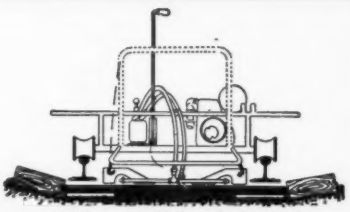
Woodings-Verona
TOOL WORKS
VERONA, PA. • CHICAGO, ILL.

NO MORE TRENCHING!
NO MORE JACKING UP TRACK!

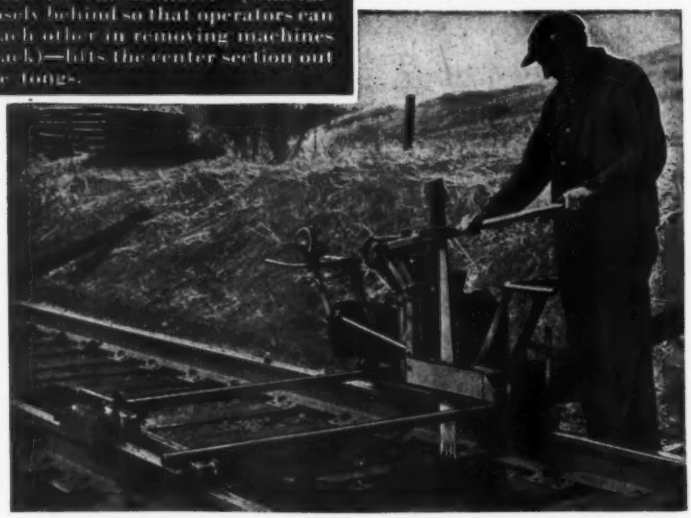
This **WOOLERY**
TIE-REMOVING TEAM
NOW ELIMINATES SLOW,
COSTLY METHOD



A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.



After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.



Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

For highest efficiency two Tie Cutters should be used ahead of one Tie End Remover.

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

WOOLERY
MACHINE COMPANY
2919 Como Ave. S. E., Minneapolis 14

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Another off-track use for a D8

Daylighting a tunnel on the Northern Pacific Railway

A CAT* D8 Tractor equipped with a No. 8U Bulldozer recently went to work for the Northern Pacific Railway, daylighting Tunnel 7, a few miles east of Superior, Montana. Morrison-Knudsen Co., Boise, Idaho, was the contractor.

The big, versatile Caterpillar D8 Tractor had a number of assignments on the job, which called for the removal of about 59,000 cubic yards of shale rock. First it constructed access trails along the steep slopes beside the tunnel so drilling equipment could be hauled in. It also dozed dirt into the tunnel to form a cushion around the ties to protect them from construction equipment. Throughout the entire job it maintained access roads and kept this important freight line clear. During rock removal operations, the D8 spread waste rock below the railroad grade for 400 feet on each side of the tunnel.

It takes dependable, all-around equipment such as the D8 to do all these vital jobs and keep work on schedule. Its 191 HP (flywheel) diesel engine can be teamed with a torque converter or with the exclusive Caterpillar oil clutch. Seven-roller track frame and "water quench" hardened track shoes give added work life. Highly effective filters and seals keep wear-causing abrasives out of all moving parts.

Your Caterpillar Dealer has a complete line of dependable crawlers ranging from the dependable 48 HP (flywheel) D2 to the mighty 320 HP (flywheel) D9. They have been designed to save you maintenance costs just as the Cat Dealer will save you capital investment by stocking an entire inventory of parts. Call him today for a demonstration on *your* job. You name the date . . . he'll be there!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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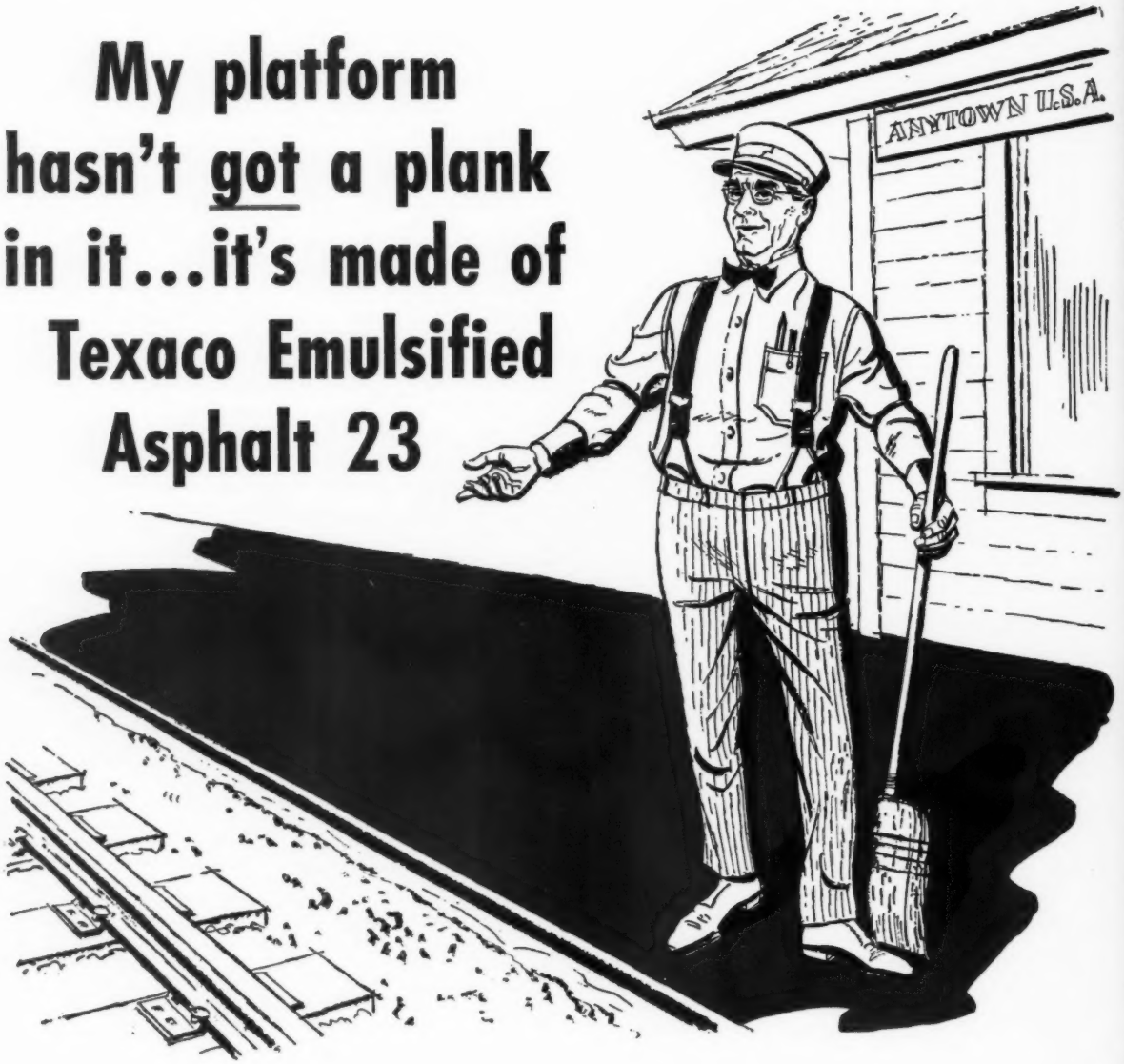
WANTED—
THE HARD WORK

My platform hasn't got a plank in it...it's made of Texaco Emulsified Asphalt 23



"Let me tell you something, folks: when you use *Texaco Emulsified Asphalt 23*, you have the makings of a really fine platform.

"No need to dry aggregate. *Texaco Emulsified Asphalt 23* mixes equally well with wet or dry aggregate.

"No heating required. *Texaco Emulsified Asphalt 23* comes ready to mix.

"And you need only a small percentage of *Texaco Emulsified Asphalt 23* to get an ideal mixture . . . you see, I'm for cutting needless expenses, too."

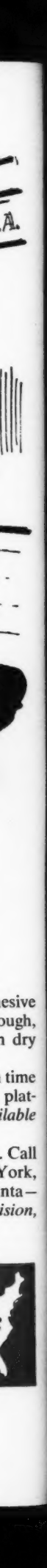
Now, if you use *Texaco Emulsified Asphalt 23* on platforms, there's a good chance you'll want to try it on crossings as well, because the adhesive and cohesive qualities of *Texaco Emulsified Asphalt 23* give tough, flexible, waterproof surfaces that last longer, drain dry and need little care.

Leading railroads find these advantages save them time and money, and lengthen the service lives of their platforms and crossings. *The same advantages are available to you.*

Cast your vote for *Texaco Emulsified Asphalt 23*. Call the nearest Texaco Railway Sales Office in New York, Chicago, San Francisco, St. Paul, St. Louis or Atlanta—or write The Texas Company, *Railway Sales Division*, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Railroad Lubricants

AND SYSTEMATIC ENGINEERING SERVICE

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